UNITED
NATIONS

E

Economic and Social Council

Distr.
GENERAL

E/CN.17/1997/2/Add.11
22 January 1997

ORIGINAL: ENGLISH

COMMISSION ON SUSTAINABLE DEVELOPMENT
Fifth session
7-25 April 1997

Overall progress achieved since the United Nations Conference on Environment and Development

Report of the Secretary-General

Addendum

Managing Fragile Ecosystems: Combating desertification and drought*

(Chapter 12 of Agenda 21)

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*The report was prepared by UNEP, as task manger for chapter 12 of Agenda 21, in accordance with arrangements agreed to by the Inter-Agency Committee on Sustainable Development (IACSD). It is the result of consultation and information exchange between United Nations agencies, international and national science organizations, interested government agencies and a range of other institutions and individuals.

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INTRODUCTION

1. The present report reviews progress made in the implementation of the objectives set out in chapter 12 of Agenda 21 (Managing fragile ecosystems: combating desertification and drought),1/ taking into account the decisions taken by the Commission on Sustainable Development on that subject at its third session, in 1995. Chapter 12 is closely linked to chapter 10 (Integrated approach to the planning and management of land resources); chapter 11 (combating deforestation); chapter 13 (Managing fragile ecosystems: sustainable mountain development); and most of the other chapters of Agenda 21 under section II (Conservation and management of resources for development), especially chapters covering climate, agriculture, biodiversity and water. Combating desertification and drought cannot be achieved without involving those other sectors. Indeed, Section I of Agenda 21 (Social and economic dimensions) which includes chapters 2 to 8, is also fundamental in combating desertification and drought.

2. The present report is the second submitted to the Commission on Sustainable Development on chapter 12, the first having been submitted to the Commission at its third session, in 1995. In considering the earlier report of the Secretary-General and the draft convention to combat desertification, the Commission outlined the scope of the problem, which places the livelihood of 1 billion people, particularly women and children, at risk. It is estimated that land degradation already significantly affects more than 100 million of the very poorest people in the world, mostly in Africa and Asia.

I. KEY OBJECTIVES

3. Chapter 12 of Agenda 21 contains six programme areas, each with three or four objectives, all dealing with measures and means, at the international, regional, national and local levels, to prevent and reverse the degradation of land resources. During the preparation of the present report, many United Nations organizations active in the field were invited to describe progress achieved, success factors and obstacles encountered to policy implementation, in accordance with their work programmes, and that information is reflected under the respective sections below.

II. SUCCESSES

A. International level: the United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, particularly in Africa

4. Within a year of the United Nations Conference on Environment and Development (UNCED), the first meeting of the Intergovernmental Negotiating Committee for the Elaboration of an International Convention to Combat Desertification (INCD) was held at Nairobi. There followed a series of negotiating sessions in various cities, supported by the INCD secretariat. Four regional annexes (for Latin America and the Caribbean; Africa; Asia; and the northern Mediterranean) were also negotiated and included in the draft

convention. The negotiations were completed within two years of UNCED, at the fifth meeting of INCD in Paris on 17 June 1994.

5. There followed a signing ceremony in Paris, in October 1994, at which 85 countries and the European Union signed the Convention. In the year it was opened for signature, the Convention garnered an additional 29 signatures to give an overall total of 115 by mid-December 1996. Having received the required 50 ratifications in September 1996, the Convention came into force on 26 December 1996. The first Conference of the Parties to the Convention will take place from 29 September to 10 October 1997 in Rome.

6. The Convention builds on experience gained from the Plan of Action to Combat Desertification, adopted by the 1977 United Nations Conference on Desertification. The Plan of Action places heavy emphasis on the involvement of non-governmental organizations and the need for a community-based, bottom-up approach, involving all stakeholders in planning and management. The importance of national and international commitment is emphasized. The need for improved access to funding is recognized by the innovative proposal to establish a global mechanism to increase the effectiveness and efficiency of existing financial mechanisms and to promote actions leading to the mobilization and channelling of substantial financial resources to affected developing country Parties to the Convention. Details of arrangements for the proposed scientific and technical committee, for the location and administrative support of the permanent secretariat, and for the hosting and functions of the global mechanism are being further discussed by INCD in preparation for decisions by the first meeting of the Conference of the Parties to the Convention.

7. Despite the speed with which the Convention was negotiated and signed, a further effort was made to encourage rapid action on desertification even before the Convention came into force. At the same time as INCD adopted the Convention, a resolution was also drafted on urgent action for Africa, which was adopted by the General Assembly in December 1994. The resolution called for immediate steps to be taken in Africa, which is especially affected by desertification, and for interim actions in other regions.

8. The emphasis placed on desertification at UNCED and the process of negotiating the Convention have been paralleled by institutional changes reflecting greater awareness and a more positive approach to dealing with desertification. The mandate of the Office to Combat Desertification and Drought (UNSO)2/ was expanded by the United Nations Development Programme (UNDP) Executive Board and endorsed by the General Assembly in its resolution 49/234 to enable action in combating desertification worldwide.

9. The Convention process encouraged a review of ongoing activities concerning desertification control in other organizations, resulting in a broader recognition of ongoing work. The review showed that several billion dollars' worth of projects that could reasonably be regarded as contributing to desertification control had been implemented, illustrating the developing recognition that combating desertification is not a narrow sectoral activity but requires a broad approach incorporating most aspects of environmental management in the drylands, which comprise one third of the Earth's land surface. Many organizations have now recognized the importance of the Convention and are accordingly reviewing and revising their approaches to working in the drylands.

Agencies with relevant mandates, such as the United Nations Environment Programme (UNEP), the United Nations Development Programme (UNDP), the Food and Agriculture Organization of the United Nations (FAO), the International Fund for Agricultural Development (IFAD), the World Meteorological Organization (WMO), the United Nations Institute for Training and Research, as well as the Sahara and Sahel Observatory, are playing a very active role in direct support of the Convention despite much reduced resources.

10. The evolution of the Global Environmental Facility (GEF) has continued since UNCED, resulting in land degradation being recognized as eligible for funding in so far as it relates to the four main focal areas of GEF. Incorporation of land degradation in GEF strategies for biodiversity, international waters and climate change represents a significant window of opportunity for project support, and reinforces the cross-linkages between those major areas and the need for cross-sectoral action.

11. There has been a surge of involvement by both national and international non-governmental organizations. Over 300 non-governmental organizations are now accredited to INCD, and many played an active role in the negotiations, contributing significantly to the final text. Networks of non-governmental organizations have been established, notably the International Non-Governmental Organizations Network on Desertification (RIOD), based in the Environment Liaison Centre International. RIOD is playing a major leadership role, with a concentration on capacity-building and awareness-raising.

B. Regional level

12. There has been increased activity at the regional and subregional levels. The African Ministers of Environment have launched the Regional Coordination Unit, in cooperation with the African Development Bank, with a view to preparing a regional action programme and coordinating the work done by African subregional organizations.

C. National level

13. As called for in chapter 12 and further encouraged by the Convention, there has been considerable progress in the formulation of national anti-desertification programmes, termed national action programmes (NAPs), and a growing recognition of their relevance to national development plans and environmental action and climate programmes. Most participating countries in Africa participating in the Convention have held national workshops to launch the preparation of their NAPs. Government ministries have either established desertification councils or committees, or have expanded the mandates of their environment ministries to work in cooperation with United Nations organizations and donors to implement those NAPs. In addition, some countries, particularly in Africa, have accorded increased attention to their national environmental action programmes (NEAPs), using them as an enabling framework to deal with issues related to the Convention.

14. Many of those States are ready to begin the initial stages of their programmes, although several of them are unable to proceed at an optimal pace due to a scarcity of their own or donor funds. In order to speed up the process, United Nations organizations are working in partnership with a number

of non-governmental organizations to provide support materials to African countries for the establishment of national desertification funds, and are also providing assistance in the fields of national legislation and institutional arrangements.

15. Other affected developing countries in the Asia and Pacific region and the Latin America and Caribbean region have also held desertification conferences for planning similar NAPs. The member countries of the Commonwealth of Independent States have been particularly active in promoting implementation of the Convention, and in Europe there is increasing political awareness that desertification is a European problem as well. There have been a number of meetings in the northern Mediterranean region to prepare implementation plans for the Convention.

16. It is harder to measure change at the grass-roots level of indigenous non-governmental organizations and communities, but there is evidence of increased coordination of indigenous non-governmental organizations, including farmers' organizations, within countries, and of a more cooperative attitude by some Governments towards non-governmental organizations and a better understanding of the work that they are trying to do. Some of the more internationally aware non-governmental organizations are urging their Governments to ratify and implement the Convention.

III. PROMISING CHANGES

17. Since the adoption of the Convention, there have been significant efforts in Africa to move land degradation and desertification issues from the margins to the centre of the political agenda for Africa's socio-economic recovery. The subject has become a regular feature during the annual meetings of the Organization of African Unity (OAU) Council of Ministers of Foreign Affairs and at summit meetings of heads of State and Government.

18. The Convention and its Regional Annex for Africa received prominent attention at the March 1995 meeting of the African Ministers of the Environment in Southern and Eastern Africa, which was convened to analyse eight environmental conventions of particular interest to Africa. The ministers resolved that the plans and programmes that have been established must provide mechanisms and modalities of implementation. They also resolved to demonstrate the necessary political will to implement the Regional Annex for Africa.

19. That kind of commitment will not only enable African States to make good progress on their own but will also serve as a basis for legitimate appeals for bilateral and multilateral funding. As part of such national initiatives, African Governments are also undertaking to involve their populations in an integrated way in the management of the environment, and to coordinate their activities with their neighbours through broader intra-African commitments.

20. Greater recognition of the issue outside Africa was evident in statements made by environment ministers in Latin America and the Caribbean at Havana in November 1995, and was also evident at regional meetings in Asia. The threat posed by desertification to small island developing States has ensured their

interest in the Convention; Micronesia and Haiti were among the first fifty nations to ratify the Convention.

21. Renewed efforts are being made by several organizations, particularly UNEP, FAO and IFAD, to seek out, evaluate and publicize success stories in sustainable dryland management. The objective is to spread the word about promising initiatives, and to counterbalance the atmosphere of hopelessness that is so easily generated by negative media coverage of the drylands.

22. One of the fundamental issues in need of attention is the more precise determination of the nature, extent and socio-economic impact and costs of desertification, which requires agreement on appropriate land quality, condition and socio-economic indicators by which changes can be assessed. A positive development in that regard is the work of the Commission on Sustainable Development on indicators of sustainable development, which has led to a concerted effort among most interested agencies to establish agreed land quality indicators as soon as possible. Scientific linkages with other major environmental concerns are also being explored through workshops and publications linking desertification and drought to problems of climate, biodiversity and carbon sequestration (UNEP, WMO, INCD and the World Bank).

23. There is also an emerging interest in the health impacts of desertification and drought. Health impacts have been a major and well documented feature of the de-watering of the Aral Sea, and are likely to be significant elsewhere as well. Increased attention to those effects is warranted.

24. A closely related and increasingly urgent concern is reflected in the preparations for the World Food Summit, which was held in Rome in November 1996. The drylands have been called the breadbasket of the world, the original home of most of the cereal crops that help sustain populations. Although total food production is still adequate for the world's population, there is still a need to take precautions against the effects of climate variability and hazards on food security, and the distribution and accessibility of food for the most needy is still far from satisfactory. There is a developing recognition of the global effects of agricultural subsidies, and of the relationships between international trade agreements, food production in the drylands, the invaluable genetic reserve base, indigenous knowledge and development. There is also improved understanding of environmental economics. Those are all promising developments.

25. Another promising change has been the launching of the Secretary-General's Special Initiative for Africa in March 1996. The Special Initiative is a broad-ranging multisectoral programme that places emphasis on many of the factors that are involved in combating desertification, and it should help to provide complementary support for the Convention. The year-long campaigns to raise awareness and political support, as well as the UNDP-led round tables, should provide additional opportunities for gaining support for the Convention. That could be seen as a means of strengthening the General Assembly resolution on urgent action for Africa with regard to early implementation of the Convention. The response to the resolution has been moderately successful, but there is a need for a further injection of funds.

IV. UNFULFILLED EXPECTATIONS

26. Throughout the history of the Plan of Action to Combat Desertification, there were unfulfilled expectations among affected developing countries that donors would commit much greater funding to desertification control, paralleled among donors by the unfulfilled expectations that affected countries would place much higher priority on the need for concerted actions and that they would ensure effective implementation and follow-through.

27. The Convention has brought new impetus to the issue, and has raised the level of political awareness, but expectations still exist and they are still less than fully met. Political commitment has undoubtedly increased in the affected countries, but few ministers of finance have desertification high on their list of priorities for action, and ministers of foreign affairs or planning do not always incorporate desertification issues and the implementation of the Convention high on their agendas.

28. Among donors, the will to succeed in the area of desertification control has increased, but at the same time available resources have diminished sharply in some countries. Priorities are being reviewed and donors are increasingly focusing on the poorest and most needy, and trying to find ways for more effective delivery of their programme support. That should lead to more realistic and appropriate development programmes, with improved success rates based on the fundamentals of poverty alleviation and long-term food security; in the short term, however, there has been a marked reduction of available funds.

29. Another aspect of that reduced level of funding is that donor support to the United Nations in general and to the multilateral agencies in particular has been reduced, at the same time as the Convention and various resolutions continue to call on United Nations organizations to provide support from their established budgetary resources. Implementation of the Convention is likely to be adversely affected if the current trend continues.

30. Disappointment has also been expressed that the new assistance paradigm described in the Convention, involving consultative processes at all levels, has not been fully recognized. Donors have not been taking up the challenge of involvement in the consultative processes to the extent hoped, despite the efforts of affected country Governments and the recommendations of the Commission on Sustainable Development.

31. The lack of adequate support and of practical indicators of land degradation has long restricted the availability of good scientific data, which has prevented recognition of the full extent of the scourge of desertification and its human impact, which in its turn has inhibited the availability of funding for science or for action in the field. The fact that there is now an agreed definition of desertification, however, is helping to focus attention on the need to improve the database. Work on assessing the economic and social aspects of the problem is gathering momentum, but much more effort is still required, particularly on environmental economics, the effects of trade and socio-economic questions.

32. Despite the major role that non-governmental organizations play in supporting improved environmental management of the drylands and the strong

support of many smaller non-governmental organizations at the negotiations for the Convention, it is disappointing that the larger international non-governmental organizations have not played a more prominent role in the follow-up process. The participation at the policy level of those major grass-roots players could greatly assist the implementation of the Convention.

V. EMERGING PRIORITIES

33. The early ratification of the Convention by all affected and interested country Parties and its speedy implementation at the national and community levels is a continued priority. A good start has been made, particularly in Africa at the national level, through holding meetings and preparing papers, but it remains a priority to transform that start into effective action in the field, with the full involvement of all stakeholders. At the regional level, there is also a need to improve coordination and more effectively develop and implement subregional action programmes.

34. At INCD, one particularly important issue remains to be resolved: that of the functions and modalities of the global mechanism, which has still to be established. The mechanism is conceived as a means of financing the implementation of the Convention, but there is considerable uncertainty as to how it will be achieved, in spite of extensive discussions continuing at INCD meetings, most recently at the tenth meeting of INCD (New York, 6-17 January 1997).

35. A long-standing priority that has in the past been inadequately addressed is the need for building capacity for implementation in affected countries, which is fundamental to achieving successful results. Chapter 37 of Agenda 21 highlights that issue and the Capacity 21 programme of UNDP has been developed to help address it. The issue is so complex and difficult to tackle, however, that despite ongoing and increased efforts there is still a great deal more to be done.

36. Another continuing priority is awareness-raising in both affected and non-affected countries of the importance of dryland environments and the significance of the desertification issue. Partly because assessment methodologies are still not adequate, there is little recognition that land degradation in the drylands alone places the livelihoods of nearly one sixth of the world's population at risk. The INCD negotiations and the bottom-up focus of the Conventions however, have contributed to a greater understanding of the problem and to the increased participation of individuals at grass-roots levels, although much more can be achieved. More attention is required to preserve traditional drought-mitigating measures at the community level.

37. The challenge of alerting people to the worldwide ravages of land degradation is a continuing, difficult but essential task. Work continues on the provision of early warning systems for drought and pest infestations, and of training on drought preparedness and management, but there is insufficient attention to comprehensive drought preparedness schemes or to researching traditional coping strategies in the face of drought. In addition, drought relief is still addressed reactively, largely on an ad hoc basis rather than through comprehensive advanced planning. Environmental refugees attract

increasing attention, but difficulties of definition provide an obstacle to serious attention although the problem is believed to be increasing steadily to involve over 20 million people.

38. The need to further integrate Convention implementation into national development plans, policies and programmes has to be recognized and accomplished, without at the same time diluting the necessity for focused and determined efforts to address the problems caused by desertification and drought. Only when desertification control is firmly established on the priority agendas of presidents and ministers of finance and planning in affected countries and ministers of overseas development/assistance in donor countries will real progress be made at the political level. Increased attention by the international community and at the country level to strategies to eradicate poverty, in particular the hardships facing rural women, can help efforts to promote alternative livelihood systems in areas prone to desertification; however, much more needs to be done in that direction.

39. The issue of the impact of debt servicing on the implementation of programmes should also be considered. For the Africa region, debt servicing is a major impediment to the successful implementation of programmes. Obviously, that issue has implications beyond the implementation of the Convention, but it is increasingly recognized as fundamental to improved development, particularly in Africa.

Notes

1/ See Report of the United Nations Conference on Environment and Development, vol. I, Resolutions Adopted by the Conference (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

2/ Formerly the United Nations Sudano-Sahelian Office; see Economic and Social Council decision 1995/232.

UNITED
NATIONS

E

Economic and Social Council

Distr.
GENERAL

E/CN.17/1997/2/Add.12
22 January 1997

ORIGINAL: ENGLISH

COMMISSION ON SUSTAINABLE DEVELOPMENT
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Addendum

Managing fragile ecosystems: sustainable mountain development*

(Chapter 13 of Agenda 21)

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I. KEY OBJECTIVES

1. The present report reviews progress made in the implementation of the objectives set out in chapter 13 of Agenda 21 (Managing fragile ecosystems: sustainable mountain development),[1] taking into account the decisions taken by the Commission on Sustainable Development on that subject at its third session, in 1995. The present report focuses on a limited number of key objectives of chapter 13 of Agenda 21, including those that are considered the most relevant in the follow-up to the United Nations Conference on Environment and Development (UNCED) context and that have been identified as priority concerns in chapter 13 follow-up. Those objectives are related to programme areas A (Generating and strengthening knowledge about the ecology and sustainable development of mountain ecosystems) and B (Promoting integrated watershed development and alternative livelihood opportunities). The two areas are often dealt with together in the framework of an integrated ecosystems approach to sustainable mountain development. However, the key objectives dealt with in the present report go beyond those identified in programme areas A and B of chapter 13 to include new themes that have come to light more recently.

2. More specifically, chapter 13 focuses mainly on the following objectives:

(a) Raising awareness of the importance of and improving understanding of sustainable mountain development issues at the global, regional and national levels;

(b) Protecting natural resources and developing technical and institutional arrangements for natural disaster reduction;

(c) Strengthening a global information network and database for organizations, Governments and individuals concerned with mountain issues;

(d) Strengthening country capacity to improve planning, implementation and monitoring of sustainable mountain development programmes and activities;

(e) Combating poverty through the promotion of sustainable income-generating activities and the improvement of infrastructure and social services, in particular to protect the livelihood of local communities and indigenous people;

(f) Formulating and negotiating regional or subregional mountain conventions and possibly developing a global mountain charter.

II. SUCCESSES

3. Since thinking about sustainable mountain development has evolved over the five years since UNCED, the issues raised in chapter 13 (which is often referred to as the "mountain agenda") have expanded beyond the original themes of the chapter to include, for example, new emphasis on conservation, culture, sacred values and landscape diversity. The element of spirituality surrounding mountains and the often special relationship between mountain peoples and the

land they live on and care for has gained greater recognition over recent years, and has become an essential driving force in the movement to conserve mountain environments and cultures. Recently, especially in Africa, the contribution of mountain ranges to water resource flows, more specifically in the chain linking water to food security, has been highlighted. There is also increasing recognition of the importance of mountain areas in terms of biodiversity conservation, economic potential and protection of downstream interests. That has led to a greater willingness to address development and conservation needs through investment programmes in areas that have traditionally been neglected in national-level development planning.

4. Progress has been made in creating greater awareness of the mountain agenda and improving coordination of efforts to protect fragile mountain ecosystems and promote sustainable mountain development, largely as a result of international and regional intergovernmental and non-governmental organizations consultations, which have provided a focus on key mountain issues and led to recommendations relevant at both the global and regional levels. Regional intergovernmental consultations have been held for Asia (1994), Latin America (1995), Europe (two sessions, 1996) and Africa (1996); a regional non-governmental organizations consultation was also held for Europe (1996). Other important meetings include the International Non-Governmental Organizations Consultation on the Mountain Agenda, held at Lima in February 1995, and other regional, subregional and national initiatives, such as the second international symposium on the theme "Sustainable mountain development: managing fragile ecosystems in the Andes" (Bolivia, 1995); an international symposium on the theme "Karakorum-Hindu Kush-Himalaya: dynamics of change" (Pakistan, 1995); an international symposium on agricultural development in mountain and hill areas (China, 1996); the Rwenzori Mountains Conference (Uganda, 1996); and an international conference on the theme "Ecohydrology of high mountain areas" (Nepal, 1996). In addition, awareness of the importance of transboundary cooperation in mountain protected areas has been increased as a result of a transboundary mountain protected area workshop, held in Australia in 1995.

5. New institutional arrangements at the global and regional levels have also contributed to progress in achieving and improving communications networking and in providing an information clearing-house function, in part through the creation in 1995 of the Mountain Forum, a network of organizations and institutions with a shared interest in sustainable mountain development. With major financial support provided by the Government of Switzerland, the Mountain Forum operates primarily as a decentralized structure with regional focal points established to coordinate networking activities. The Consortium for the Sustainable Development of the Andean Ecoregion, convened by the International Potato Center (CIP), a member of the Consultative Group on International Agricultural Research, has been selected as the focal point for Latin America and the Caribbean. The International Centre for Integrated Mountain Development (ICIMOD) is coordinating networking in Asia and the Pacific, both at the regional level through the Asia Pacific Mountain Network and at the subregional level since the establishment of the North and Central Asia Mountain Network. Together with The Mountain Institute, those organizations make up the Mountain Forum's Interim Facilitating Committee, which has been set up at the global level with the specific purpose of assisting in building the network. Regional networks are also being established in Europe and Africa, mainly through the

efforts of non-governmental organizations. The Mountain Forum is one of several innovative partnerships and alliances being studied under the Global Excellence in Management Initiative by Case Western Reserve University in the United States of America. Documenting the way in which the Mountain Forum is expanding capacity beyond its own organizational boundaries is expected to be an important outcome of the study. Another important example of new regional cooperation is the Asociación de Montañas Andinas, whose main objective is to contribute to implementation of chapter 13 in the Andes.

6. Land-use planning and management tools are being developed for mountain watershed areas through the preparation of principles and best practices for sustainable mountain development programmes. They are intended to serve as a tool for national and subnational planning, and are expected to build on existing guidelines on mountain conservation and development. They should also be complementary to the guidelines and planning tools that have been developed in other sectors, such as national forestry action programmes and national conservation strategies, and should be consistent with land-use planning tools being developed under chapter 10 of Agenda 21. That work is expected to be field tested, refined and in limited use by the year 2000.

7. In a growing number of countries, the livelihoods of local communities and indigenous populations are being protected and improved through mountain development programmes and projects that include a variety of income-generating activities and the improvement of infrastructure and social services. A significant change has been observed in many development assistance projects, which currently tend to include greater support to human development and poverty alleviation in addition to more traditional technical concerns of watershed management and protection. The Food and Agriculture Organization of the United Nations (FAO)/Italy Interregional Project for Participatory Upland Conservation and Development, which has been operating in five countries since 1991, provides a promising example of an approach that focuses simultaneously on developing new livelihood opportunities and carrying out watershed management and natural resource conservation, through planning efforts led by local stakeholders. Requests for assistance in mountainous developing countries are being received by donors and development cooperation agencies to improve planning and implementation of programmes that aim to achieve a good balance between local development needs and resource protection and conservation.

8. Progress has been made in the area of biodiversity conservation in mountain areas through action taken by many countries in establishing new protected areas, in undertaking trans-frontier collaboration in protected area management, and in the development of several recent initiatives to link mountain protected areas through corridors in mountain ranges so that large protected bioregions are established. Additionally, more attention has been devoted to the important contributions that have been made by farmers and indigenous peoples to the conservation of biological diversity, as demonstrated, for example, by the use of potatoes as a staple food crop in the Andes. As the issue of mountain biodiversity conservation receives increasing attention, linkages are being reinforced with the Convention on Biological Diversity. For example, the conclusions of the European intergovernmental consultation on mountains related to that issue were presented and discussed at the third meeting of the

Conference of the Parties to the Convention, held in November 1996 at Buenos Aires.

9. Progress has been made in the development of criteria and indicators for sustainable mountain development, based on a collaborative effort involving United Nations bodies and a limited number of other organizations and institutions. That work has focused on the condition of natural resources, human welfare and population dynamics. If the indicators currently being developed are to be of practical use and effective, however, further elaboration will be required, including input from planners and practitioners, especially at the country level. Once refined and field tested, the indicators being developed under chapter 13 are expected to provide planners and executing agencies with a basis for monitoring and assessing the impact and sustainability of mountain development programmes.

III. PROMISING CHANGES

10. New forms of partnership are coming about as a result of increased collaboration and interaction between the public and private sectors, in which Governments, non-governmental and intergovernmental organizations have found common ground and engaged in constructive dialogue. There has been a concerted and participatory effort, particularly over the past three years, to amplify the original aims and objectives of chapter 13 by forging consensus on priorities and identifying the differing strengths and capacities of public, private and non-governmental organizations sectors to contribute to implementation. In addition, there has been greater emphasis on including local populations and community groups in identifying and planning mountain development activities. New partnerships are also being realized between mountain research and development interests. International research institutes, such as CIP, ICIMOD, the International Centre for Research in Agroforestry (in particular through the African Highlands Initiative) and the joint United Nations University (UNU)/International Mountain Society (IMS) project, which have either a specific mountain focus or include strong mountain research programmes, have been active members of the inter-agency network on mountains. That has served to strengthen the linkages and interaction between mountain research and development interests. Such organizations as the International Union for Conservation of Nature-World Conservation Union (IUCN), the International Center for Alpine Environments and the International Livestock Research Institute have increased their involvement in mountain conservation and development, and have developed new partnerships through their roles in planning and implementing the regional intergovernmental consultations in Europe and Africa.

11. Although there are still relatively few activities that have been initiated directly as a result of chapter 13, the willingness of most regions of the world to engage in intergovernmental and non-governmental consultations on the topic of sustainable mountain development has been an important step in implementation since UNCED. That process has allowed for clearer definition of the challenges facing each region and possible responses to them, and a stronger sense of involvement and commitment on the part of Governments and other concerned stakeholders as the discussion has focused on issues of greater direct relevance at the regional and national level. That consultation process has been carried

out over a relatively short period, having begun only in late 1994, with the majority of meetings having taken place during 1996. Although there has been insufficient interest to date by Governments of North America to hold an intergovernmental consultation there, a meeting organized by non-governmental organizations, to which Governments would also be invited is currently under discussion. As a result of those regional meetings, greater activity is expected at the national and regional levels in terms of specific mountain development and conservation programmes and reinforced institutional arrangements. Regional networks, in addition to those in Asia and Latin America, are also being established in Europe and Africa, following consultations held in 1996. In accordance with the recommendations of the Commission on Sustainable Development at its third session, upon completion of the regional consultations a wider international meeting on sustainable mountain development is expected to be held. Several Governments have already expressed their support for holding such a meeting, the objectives of which, however, would need to be clearly defined and perceived as timely and relevant to ongoing implementation for the countries and organizations involved.

12. The maintenance and generation of database and information systems to facilitate the integrated management and environmental assessment of mountain ecosystems has seen little progress to date; however, that is expected to change in the near future given new and evolving institutional arrangements and new technologies becoming available for that type of work. In the area of conventional dissemination of scientific and developmental information on mountains, the quarterly journal Mountain Research and Development, co-published by UNU and IMS, continues as the only scholarly publication of its kind worldwide.

13. Improvements to the ecological knowledge base for technologies and agricultural and conservation practices in the mountain regions of the world have been slow but have recently been increasing. Most conservation and development programmes in mountain areas now contain specific components for improving databases on biological resources. On the other hand, economic, sociological and cultural information are still largely unavailable. Greater emphasis is being placed on the importance of understanding and promoting appropriate indigenous and locally adapted technologies.

14. Transnational cooperation has also been improving. There is an increased willingness to work across national borders marked by mountain chains, in particular for scientific reasons, such as to study the behaviour of migratory species, for environmental conservation purposes, and for ecological/economic reasons among countries sharing major watercourses. Transborder collaboration among biosphere reserves is a new emerging topic in the Man and the Biosphere programme of the United Nations Educational, Scientific and Cultural Organization, in particular in Eastern and Central Europe. There is also a need for greater cooperation among countries sharing water resources, especially in many regions of the world where there is growing demand for water.

15. Work has progressed on the better understanding and dissemination of information regarding environmental risks and natural disasters in mountain ecosystems. At the twentieth session of the FAO/European Forestry Commission Working Party on the Management of Mountain Watersheds, held at Lillehammer,

Norway, in July 1996, the topic of mitigation of natural disasters in mountain areas received significant attention, both in the European and global context. That topic was also dealt with in depth at the June 1996 meeting of INTERPRAEVENT, a group of European experts meeting at Garmisch, Germany, to discuss cooperation in research, technology transfer, planning and development relating to natural resources management in mountain areas, at which the protection of alpine areas against natural disasters, such as floods, avalanches and mudflows, was discussed at length. ICIMOD has also been very active in that field, and has recently launched a training programme for mountain risk engineering in the Himalayas. Also, the Working Group on Natural Disasters of the International Union of Forestry Research Organizations (IUFRO) plans to hold a meeting in the framework of the Eleventh World Forestry Congress (Antalya, Turkey, 13-22 October 1997). The meeting will consider, inter alia, hazard prevention measures in mountain regions. That cross-cutting issue is expected to receive increasing attention in the near future as a result of greater awareness created through international initiatives, such as the 1994 World Conference on Natural Disaster Reduction, and new and ongoing efforts by international bodies, such as those mentioned above.

16. Perhaps most importantly and underlying most other factors that have contributed to the relatively successful implementation of chapter 13 is the notion of commitment. Many of those who advocate the sustainable development and conservation of mountain regions and peoples speak with conviction and deep emotional commitment to many of the causes espoused by chapter 13. The various stakeholders working on mountain-related issues, whether from local communities, non-governmental organizations, Governments or international organizations, often share a common view of the importance and uniqueness of mountain areas and cultures, and carry out their work with a strong sense of dedication. Their conviction and the partnerships that were forged prior to UNCED, were instrumental in gaining chapter status for mountains under Agenda 21, and in maintaining close collaboration throughout the post-UNCED period.

IV. UNFULFILLED EXPECTATIONS

17. Several objectives of chapter 13 remain unfulfilled or have seen little or no progress towards implementation, as described below.

Survey work

18. Adequate progress has still to be made in undertaking integrated survey work of the different natural resources and their use in mountain ecosystems, and carrying out related activities needed to strengthen knowledge about the ecology of mountain ecosystems. Although greater progress is being made at the regional level, a longer time-frame than the five years since UNCED will be required to achieve a more thorough understanding of the knowledge base globally.

National-level institutional arrangements

19. Although the issue has been raised in various forums since UNCED, there continues to be a lack of new institutional arrangements at the national level

to enable a more comprehensive and integrated approach to mountain conservation and development. In spite of increased international attention since UNCED on the need for reform (through chapter 13 follow-up), examples of departments, programmes or legislation that deal with mountain issues in a more integrated way are still rare, which has been an inhibiting factor in carrying out comprehensive national mountain development planning.

Special attention to mountainous island countries and landlocked countries

20. Little attention has been paid so far to the need for specific consideration for mountainous island countries and landlocked mountainous countries. Island countries face a unique situation, especially with regard to water resources. Greater efforts are needed to better understand the technical issues facing that category of countries.

V. EMERGING PRIORITIES

21. Upon completion of the current consultation process for chapter 13 follow-up in late 1996, many of the issues concerning sustainable mountain development, which have so far been discussed in rather general terms at the global level, will also have benefited from discussion in a regional context, allowing for further elaboration, refinement and regionally specific proposals for action. That process has allowed an increased focus on specific objectives of chapter 13 and better understanding of how they can best be achieved. Some key objectives that have emerged during UNCED and the five-year review period, for which it now seems likely that obstacles to achievement can be overcome, are described below.

Special status of mountain areas

22. One of the important achievements of the chapter 13 review process has been greater recognition of mountain areas as special and distinct from lowland areas, and therefore worthy of special attention. That recognition is seen as a key factor in the recent change of attitude of Governments, intergovernmental organizations and non-governmental organizations to pay greater attention to mountain conservation and development, as well as in the mobilization of the resources that will be needed for increased investment in mountain areas. Greater action at the national level is required, including, for example, the formulation of national mountain development plans as part of national development plans.

Legal and institutional mechanisms

23. There is also greater recognition of the need for new or reinforced legal mechanisms (charters, conventions, national legislation etc.) to protect fragile mountain ecosystems and promote sustainable and equitable development in mountain regions. Additionally, Governments, intergovernmental organizations and non-governmental organizations agree that more suitable institutional mechanisms are required to assure an integrated approach in view of the complexity of mountain ecosystems and the socio-economic issues at stake.

Investment in mountain development and conservation

24. More mountain-specific investment programmes and greater mobilization of financial resources for mountain development and conservation programmes will be required in order for real progress to take place on the mountain agenda. In some cases, that may mean formulating and financing programmes that are focused exclusively on mountain areas; other situations may lend themselves to expanding conservation and development programmes that have been designed for lowland areas to include mountain areas as well. There are promising signs of greater willingness on the part of Governments to increase investment levels in mountain areas, which have historically been neglected. In addition, bilateral and multilateral donors have expressed greater willingness to assist mountainous developing countries in elaborating and implementing mountain development plans and programmes, in accordance with the increased attention being given to mountain regions and a redefinition of priorities. Greater investment potential in upland areas is motivated not only by the need to protect downstream infrastructure and populations but also by the realization of the importance of economic development of mountain populations for their own benefit and the potential contribution to national economies, as well as by an increasing awareness of the importance of biodiversity conservation.

Resource flows

25. In connection with paragraph 24 above, there remains a need for clearer understanding of resource flows to and from mountain areas, that will lead to increased income for mountain communities and a fairer distribution of earnings from natural resources exploitation and services provided in mountain areas. Increased attention is already being paid to that important issue, as evidenced by the electronic conference hosted by the Mountain Forum in 1996, on the theme "Paying for mountains: innovative mechanisms and promising examples for financing conservation and sustainable development". The increased attention being paid to that issue, especially as certain mountain resources, such as water, become more scarce and acquire greater economic value, is expected to result in more studies undertaken to improve understanding of the overall flow of resources and services.

Status of women and children

26. The need for greater empowerment, equity and equality of mountain women has been expressed as an important concern throughout the period of UNCED and chapter 13 follow-up. Those issues are expected to receive greater attention in terms of policy, legislation and institutional reform, with growing awareness and recognition of the role and needs of women related to mountain development. A recent publication by UNICEF, Children, Women and Poverty in Mountain Ecosystems,[2] produced in collaboration with UNU and IMS, is already drawing attention to the basic causes of poverty in mountain areas and the need for policy revisions.

Cultural integrity and biological diversity

27. There is growing recognition of mountain areas as valuable sites for preserving cultural integrity and conserving biological diversity, which has

come about through increased awareness of specific mountain cultures and their important role in maintaining mountain ecosystems, as well as greater recognition of the endemism of plant and animal species in mountain areas. More concerted action is needed to address those increasingly important areas of concern.

Monitoring progress

28. As the mountain agenda moves forward and mountain development and conservation efforts grow, it will be necessary to be able to gauge progress and the extent to which it is sustainable. An enhanced ability to carry out assessment and monitoring of mountain development and conservation activities will be required. The development of a set of criteria and indicators for sustainable mountain development has been under way since late 1995. That work is currently being refined with the aim of providing a practical tool for use at the national or subnational level.

Exchange of experience and information collection and dissemination

29. More direct exchange of experience and information, both among mountain people themselves and among other resource management practitioners working in mountain areas, is needed. Exchange visits between groups of farmers from neighbouring upland communities have proved to be among the most effective means of stimulating new ideas and transferring knowledge in many mountain conservation and development projects throughout the world in recent years. The networks that have been created over the past few years, especially through the activities of the Mountain Forum and regional intergovernmental and non-governmental organizations consultations, should be fully exploited to stimulate and enhance that type of direct exchange at all levels. There is also a need for greater accessibility of existing information to end-users, both at policy and operational levels. In fact, knowledge and information dissemination was identified at a 1996 European intergovernmental consultation on chapter 13 as a priority area to be addressed. Some key issues raised include the needs to standardize data and data collection; ensure greater accessibility of scientific data to decision makers; improve inter-ministerial communication on mountain issues; and ensure more interdisciplinary and applied research on mountains.

Food security

30. As highlighted at the World Food Summit held by FAO in Rome in November 1996, the issue of food security has become a top priority for the global community. Accordingly, efforts to eradicate hunger and malnutrition are expected to receive greater attention under chapter 13, along with the overall objective of poverty alleviation in mountain regions. New initiatives in that area should focus specifically on strategies to enhance food security in a sustainable manner, inter alia, through the sustainable flow of water resources and their efficient use for agricultural and other production systems.

Mountain forests

31. Since new interest and attention is being devoted to the forest policy debate, especially since the establishment by the Commission of the

Intergovernmental Panel on Forests, new opportunities are available to further discuss the important role played by forests in mountain areas with respect to such issues as hazard prevention, biodiversity conservation and livelihood opportunities. New institutions and forums, including the European Observatory on Mountain Forests and the IUFRO Task Force on Forests and Mountain Development, have recently been established to focus specifically on such issues. FAO is also giving greater recognition to the importance of forests in mountain regions, and is currently in the process of preparing a publication on the management of mountain forests.

Notes

[1] Report of the United Nations Conference on Environment and Development, vol. I, Resolutions Adopted by the Conference (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

[2] New York, 1996.

UNITED
NATIONS

E

Economic and Social Council

Distr.
GENERAL

E/CN.17/1997/2/Add.13
22 January 1997

ORIGINAL: ENGLISH

COMMISSION ON SUSTAINABLE DEVELOPMENT
Fifth session
7-25 April 1997

Overall progress achieved since the United Nations Conference on Environment and Development

Report of the Secretary-General

Addendum

Promoting sustainable agriculture and rural development*

(Chapter 14 of Agenda 21)

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* The present report was prepared by the Food and Agriculture Organization of the United Nations (FAO) as task manager for chapter 14 of Agenda 21, in accordance with arrangements agreed to by the Inter-Agency Committee on Sustainable Development (IACSD). It is the result of consultation and information exchange between United Nations agencies, international and national science organizations, interested government agencies and a range of other institutions and individuals.

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I. KEY OBJECTIVES

1. The present report reviews progress made in the implementation of the objectives set out in chapter 14 of Agenda 21 (Promoting sustainable agriculture and rural development),[1] taking into account the decisions taken by the Commission on Sustainable Development on that subject at its third session, in 1995. The major objective of sustainable agriculture and rural development (SARD), as spelled out in chapter 14 of Agenda 21, is to increase food production in a sustainable way and enhance food security. That ambitious task requires education initiatives, economic incentives and the development of appropriate and new technologies, as well as employment and income generation to alleviate poverty, and natural resource management and environmental protection.

2. The 12 programme areas of chapter 14 are closely related to other chapters of Agenda 21, especially chapters 10, 15, 18 and 19. Those programme areas, which address issues of policy and agrarian reform, participation, particularly of rural people, income diversification, land conservation and improved management of inputs, define the key objectives of the chapter.

II. SUCCESSES

3. The recent World Food Summit organized by FAO (Rome, 13-17 November 1996) marked a milestone in international acceptance and commitment to achieve the goals of enhanced food production and food security. Summit participants deplored the continued widespread prevalence of hunger, and pledged at the very least to halve the current numbers of malnourished, estimated at more than 800 million, by 2015 and preferably earlier. They also recognized the need for the sustainable management of natural resources and protection of the environment, and committed themselves to implement the outcome of the United Nations Conference on Environment and Development (UNCED), particularly with regard to chapter 14 of Agenda 21. Initial proposals broadly outlining how a World Food Summit monitoring system might function are currently being developed for discussion among concerned institutions, for subsequent consideration by the FAO Committee on World Food Security at its twenty-third session, in April 1997. Parallel to that process, the Administrative Committee on Coordination (ACC) has been invited by the United Nations General Assembly to consider an appropriate inter-agency mechanism to assist in the implementation of the World Food Summit Plan of Action, and to report on its decision to the Economic and Social Council at its substantive session of 1997.

4. The Summit sent a strong and committed political message. Yet there are similar initiatives that were already present at the time of UNCED in June 1992, and have since evolved further. In general terms, in the developed countries, progress towards meeting SARD objectives appears linked to land "set-aside" programmes as a consequence of weak food markets and hence low prices of the early 1990s. The opportunity still has not been taken of linking set-aside programmes to environmental objectives.

5. In the economies in transition, there is the continuing issue of transferring agricultural production systems to market mechanisms. Some

progress has been made in correcting the worst polluting production systems. The desire to gain access to western food markets is guiding production practices to meet food quality standards. The risk remains of those countries adopting unsustainable agricultural policies that promote production without adequate environmental protection.

6. In the developing countries, there is a continuing dilemma over production/income and environmental goals. Some progress has been made in phasing out input subsidies, usually under fiscal pressures. Access to western food markets is also an important factor for some countries and products. The strategy of the sustainable intensification of already converted land of greatest production potential is beginning to be more widely accepted and introduced. Adoption of such a strategy should reduce the pressure on more marginal and environmentally fragile lands.

7. There is a growing awareness in most countries of the necessity and desirability of integrating environmental concerns into agricultural policies by, inter alia, (a) adjusting agricultural support prices and encouraging farmers to adopt environmentally sensitive production and harvesting methods; (b) the preparation of national environmental action plans (NEAPs) in some developing countries, which results in a better understanding of needs for addressing environmental problems, including SARD programme areas; (c) undertaking sectoral agricultural policy reviews in food-deficit low-income developing countries to improve sustainable food security; and (d) in countries with economies in transition, the transfer of land property rights into new forms of agricultural enterprises, and the introduction of policies to take marginal lands out of production.

8. Regarding the effects of the Uruguay Round of multilateral trade negotiations on agricultural trade and production, various studies reflect the view that the direct impact of the Uruguay Round is likely to be negligible on global agricultural production, with some reduction in the output of temperate zone products in developed countries and a small offsetting rise in developing countries overall. The Uruguay Round is expected to lead to significant gains in trade revenue for countries in Latin America and the Caribbean, and to loss for most African countries as well as for countries in transition in Europe. The impact of the Uruguay Round on the objectives of SARD, which go beyond environmental considerations, has not yet been assessed, although an FAO study, being conducted in collaboration with the United Nations Conference on Trade and Development and the World Trade Organization is under way.

9. In the area of peoples' participation, including development of human resources, there is a better understanding of how to utilize the reciprocal relations both within and among formal and informal civil society institutions to strengthen their involvement in decision-making and policy-making processes. The role and participation of women in sustainable agriculture and rural development is recognized as essential, as is the need to integrate women's activities into ongoing and planned programmes and projects. It is now understood that coalitions and networks must be formed to assist the process of consensus-building. In practice, progress has been marked by institutional restructuring of agricultural cooperatives; legislation reforms to facilitate the formation of civil society organizations, such as rural workers' and

farmers' self-help organizations; and the empowerment of informal coalitions in civil society. There is now better collaboration between the United Nations system and international trade union organizations and federations of agricultural producers, such as the International Federation of Agricultural Producers. Capacity-building is focusing, inter alia, on strengthening rural organizations' abilities to gain access to inputs, credit and training of trainers in cooperative membership formulation. The aim is to build up social/organizational capital at the local levels (see boxes 1 and 2, for examples). Another example is the creation of the National Rural People's Concertation Committee in Senegal to act as an interlocutor of rural people's movements with the Government and external partners. The Committee now consists of nine national federations representing farmers, herders and fisherfolk. The establishment in 1996 of the Platform of Peasant Organizations in the Sahel extends such organizations' ability to conduct a policy dialogue at the regional level, for example with the Interstate Committee to Combat Drought in the Sahel.

10. It is becoming clear that land conservation and rehabilitation activities can only be carried out at a reasonable cost and over large areas through the activities of the land-users themselves. Governments and donors are moving away from trying to carry out large-scale soil conservation projects themselves. There has been progress in implementing various initiatives under the FAO International Scheme for Conservation and Rehabilitation of African Lands, and its new counterpart in Asia since January 1996, the Conservation of Lands of Asia and the Pacific. Under the Scheme, Malawi has produced a national land-use and management policy and five-year action plan. That inter-ministerial effort addresses such issues as land rehabilitation, waste disposal, smallholder farmers, land tenure and property rights, and business and industry (investment and research). Other initiatives include the introduction of the Sloping Agricultural Land Technology in several Asian countries, the development of traditional soil and water conservation technologies in the Sahel, and increasing activities within national action plans (NAPs) under the United Nations Convention to Combat Desertification in those Countries Experiencing Drought and/or Desertification, particularly in Africa. A parallel initiative is the formulation of FAO/United Nations Environment Programme National Soil Policy documents. The policy document prepared for Jamaica has led to funding proposals, and serves as a useful model for promoting the idea to other countries, especially small island States faced with soil degradation. Maintaining the productivity of agricultural soil and rehabilitating arable lands are particularly significant issues in the context of the deliberations under way in the Commission's Intergovernmental Panel on Forests, in which the creation of additional agricultural land has been noted as a principal factor in deforestation and the associated loss of the socio-economic value of forests in tropical regions.

Box 1. Farmer-centred Resource Management Programme and Farming System Development approaches

In Asia, an FAO/UNDP/UNIDO Farmer-Centred Agricultural Resources Management programme for sustainable agriculture has been launched to support the implementation of Agenda 21 in China, India, Indonesia, Nepal, Philippines, Sri Lanka, Thailand and Viet Nam. The programme is targeted to resource-poor communities and farm households, with an overall objective of improved conservation, management and utilization of natural resources in rain-fed lowlands and uplands. It has seven subprogrammes, on participatory development; farming systems; watershed management; agroforestry; integrated pest management; safe pesticides; and biotechnology and biodiversity.

In Eastern and Southern Africa, farming system development now features prominently in Kenya, the United Republic of Tanzania, Zambia and Botswana, achieved through awareness programmes for decision makers, human resources development programmes and networking. In the Sudano-Sahelian region of West Africa (Niger, Benin, Burkina Faso, Senegal), a new generation of sustainable resources management projects is increasingly using a comprehensive farming system development approach. In Benin, the Recherche âgronomique en milieu Reel project aims to improve the technological transfer process, and the Poursuite des etudes en milieu reel project advocates improving farmers participation in rural development.

In Latin America, more comprehensive systems are being launched to promote farming system development, particularly in marginal areas in Peru, Ecuador and Brazil, with the aim of promoting participatory rural development. Attention is also focused towards increased demand for technologies that are more appropriate for small farmer conditions, such as labour-intensive technologies, agro-ecological and organic farming systems and low-input farming. A private agricultural services sector is beginning to emerge. A network of rural farmer credit unions is being established, e.g., in the Dominican Republic, Honduras and Peru. State-run national agricultural research and extension institutions have been reduced in size and functions, but are beginning to be replaced by private research and extension institutions, e.g., in Chile.

Box 2. Promising changes in people's participation at field level

Although progress in raising awareness on people's participation has been slow in most developing countries, notable progress has been achieved in such countries as Indonesia, Sri Lanka, Pakistan, Tanzania and Zambia, where Governments are currently experimenting with the introduction of new participatory and small community-based approaches for supplying farm inputs and services. Bolivia has recently embarked on an ambitious programme to promote more effective participation of rural people at the municipal level, and other Latin American countries such as Chile, Ecuador, Mexico and Venezuela, have embarked on similar schemes. New cooperative legislation is now in the process of being discussed and debated in a broad range of countries, including Zambia, Guinea, India and Viet Nam. With declining government budgets for rural developments, many non-governmental organizations are now playing more significant roles towards enhancing people's participation. Rural people's organizations are now entering into the dialogue processes with Governments in shaping sustainable agricultural policies.

11. The objectives of the programme area on the conservation and sustainable utilization of plant genetic resources for food and agriculture (PGRFA) are being pursued essentially through the FAO Global System. The mandate of the former FAO Intergovernmental Commission on Plant Genetic Resources, which monitors the Global System, has been broadened to cover other aspects of agricultural biodiversity and renamed the Commission on Genetic Resources for Food and Agriculture. The Fourth International Technical Conference on Plant Genetic Resources, held at Leipzig in June 1996, welcomed the first issue of the periodic Report on the State of the World's Plant Genetic Resources, and adopted the Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources, which focuses on implementing programmes that aim towards conservation, sustainable utilization and sharing of benefits. Through the Commission on Genetic Resources, countries are negotiating the revision of the International Undertaking on Plant Genetic Resources in harmony with the Convention on Biological Diversity, including the realization of farmers' rights and the issue of access on mutually agreed terms to PGRFA, including ex situ collections not addressed by the Convention.

12. In addition, the FAO World Information and Early Warning System is promoting a worldwide information network that provides the basis for a periodic revision of the Report on the State of the World's Plant Genetic Resources. Furthermore, 12 agricultural research centres associated with the Consultative Group on International Agricultural Research (CGIAR) have put their core collections, with about 500,000 accessions, under the auspices of FAO, within the International Network of Ex Situ Collections.

13. Key Agenda 21 objectives concerning the conservation and sustainable utilization of animal genetic resources for sustainable agriculture have been met through the FAO Initiative for Domestic Animal Diversity. The Global Strategy for the Management of Farm Animal Genetic Resources has been launched, with a mission to document existing animal genetic resources, develop and improve their utility to achieve food security, maintain those that represent unique genetic material and that are threatened, and facilitate access to animal genetic resources that are important to food and agriculture. A key output of the Global Strategy thus far has been a joint FAO/UNEP publication, The World Watch List for Domestic Animal Diversity. According to the Global Databank, more than 300 breeds of animals used for food and agriculture are endangered.

14. The global community has also made considerable progress in recognizing the contributions to sustainable agriculture of the conservation and sustainable use of agricultural biological diversity, as reflected, for example, in the decision of the Conference of the Parties to the Convention on Biological Diversity at its third meeting to establish a multi-year programme of activities on the sustainable use of agricultural biological diversity, aiming, inter alia, to promote the positive and mitigate the negative effects of agricultural practices on biological diversity. As part of that effort, the Conference of the Parties has invited FAO, in close collaboration with other relevant United Nations bodies and regional and international organizations, to identify and assess relevant ongoing activities and existing instruments at the international level.

15. Considerable progress has been achieved in the area of integrated pest management (IPM). The most widely quoted successful IPM programme is rice in Indonesia, but other programmes have been mounted in Viet Nam, China, India and the Philippines. IPM is being introduced in Africa (see box 4 on Ghana), and has had quite a long history in Latin America and the Caribbean. An IPM facility, combining the efforts of FAO, UNEP, the United Nations Development Programme, the World Bank and the Centre for Agriculture and Bioscience International, has been established in direct response to Agenda 21. It will provide the link between donors, co-sponsoring agencies, farmers' groups, and national and local governments and non-governmental organizations. The International Centre of Insect Physiology and Ecology consistently uses IPM methods in complementing the activities of CGIAR centres in plant health, which its expertise and facilities in insect biology, physiology, ecology and behaviour well qualify it to do. Success has been noted not only in plant pest control through IPM but also control of disease vectors, such as tsetse and mosquitoes. Experience in mounting IPM programmes has shown that for such programmes to succeed farmers must be the primary decision makers in crop production systems, and improving their analytical ability, typically through farmers' field schools - is the key to IPM. In that regard, it is to be noted that their decisions are influenced by the policy environment, such as input subsidies or other government programmes, which may dissuade them from adopting IPM methods.

16. The development of organic farming and associated accreditation schemes continues in response to consumer concerns on food quality. Progress has also been made in negotiating a legally binding instrument on the prior informed consent procedure for certain hazardous chemicals and pesticides in international trade, under the joint auspices of UNEP and FAO.

17. Other forms of biological control that are finding widened application include the sterile insect technique, which has been refined by FAO/the International Atomic Energy Agency through the use of nuclear gamma irradiation, for example in eradication programmes for the New World screw worm in North Africa and the Mediterranean fruit fly in South America.

18. With regard to integrated plant nutrition management and associated systems, some progress has been achieved in identifying and carrying out country-level appraisals of all currently and potentially available sources of plant organic and mineral nutrients. Concepts have been sharpened through expert consultations and the sharing of experience (e.g., between FAO and the CGIAR International Food Policy Research Institute) and by field trials in South and South-East Asia. Non-governmental organizations, such as the Swaminathan Research Foundation in India, have been particularly active in that area. Progress is often constrained by the fact that such activity requires access to external sources of nutrients as well as large inputs of labour, particularly in cases in which massive quantities of biomass are to be recycled.

19. With regard to the evaluation of the effects of ultraviolet radiation caused by the depletion of the stratospheric ozone layer, the evidence suggests that ultraviolet irradiation resulting from stratospheric ozone depletion has little adverse effect on photosynthesis or growth under field conditions, although there may be longer-term damage to nucleic acids. In contrast, increased tropospheric ozone levels arising from atmospheric pollution will have immediate adverse effects on most plant species.

III. PROMISING CHANGES

20. The following important common policy approaches are emerging in the promotion of SARD: (a) the use of economic incentives to guide sustainable agricultural practices; (b) education and information exchange for human development; (c) the development and transfer of new and appropriate technologies; (d) farm and off-farm employment for alleviating poverty; (e) sound natural resource management leading to environmental protection; and (f) focusing on men and women farmers themselves.

21. It is noteworthy that rural energy technologies, such as wind energy, have seen a significant decline in cost in recent years. Power generation from wind farms or single systems has grown dramatically, not only in Europe and the United States of America, but in India, China, Mexico and Indonesia. Solar photovoltaic (PV) systems are gradually reaching competitive prices, and the market has expanded considerably. Large PV programmes in Mexico, India, China, Argentina and other countries have been implemented since UNCED. Continued privatization and deregulation of electric power utilities worldwide is providing new opportunities to generate electricity through renewable energy technologies. Impressive technical progress has led to successful small-scale off-grid PV applications, as well as wind energy projects and co-generation from biomass residues. However, in the transition of rural energy policies and technologies to cost-effective energy sources, progress crucially depends on economics. Getting energy cheaply from renewable sources to small-scale farming families in developing countries is still far from being realized.

22. Other promising developments in implementing SARD have occurred, for the industrialized economies, in the areas of policy integration, setting agrochemicals reduction targets, the introduction of environmental taxes and other policy instruments, and a growing awareness of organic farming. In developing economies, new initiatives have reflected farmer-centred approaches and people's participation and IPM programmes (see boxes 3 and 4).

Box 3. Promising changes in policy integration and introduction of organic farming practices in OECD countries

Although OECD countries in the past relied heavily on regulatory measures, the use of economic instruments has continued to expand in recent years. Environmental taxes in the agriculture sector focus primarily on pesticides, fertilizers and manure wastes. The most commonly practised market-based measure is the use of environmental fees for discouraging farmers to use pesticides, including a 20 per cent sales tax on pesticides in Denmark, a 13 per cent tax on purchase price of pesticides in Norway and a $2.50 tax per kg of pesticides in Sweden. In addition, voluntary programmes introduced encourage farmers to practice IPM methods.

Some OECD countries have already set agrochemicals reduction targets. For example, Canada and the Netherlands have opted to cut pesticide use by 50 per cent (base year 1985-1988) by 2000, and Denmark by 25 per cent (base year 1991) by 1997. Previously, Sweden had opted to cut use by 50 per cent (base year 1981-1985) by 1990. The Netherlands imposed an excess manure tax: while farms producing up to 125 kg/ha/yr of manure are exempted from the tax, a tax rate of 0.25 guilders per kg is set for farms producing between 125 and 200 kg of manure per year, and 0.50 guilders per kg beyond 200 kg/ha/yr. Norway introduced a fertilizer tax set at 1.21 kroner per kg of nitrogen and 2.30 kroner per kg of phosphorus. Finland has introduced a similar tax.

Austria, Italy, Spain and Switzerland have established minimum forage areas for cattle. In Spain, over a five-year period it is aimed to expand the organic farming area from the current level of 12,000 ha to 28,000 ha by the year 2000.

Recent information on organic farming in the European Union (EU) shows increasing adaptation, with Germany having almost half the total area in the EU. One comparison of area under organic practices between 1987 and 1993 indicates that in most countries, area increased by 100-300 per cent, but from a small base. The number of farmers using organic techniques also nearly doubled in the EU between 1987 and 1992, from an initial figure of 7,500 to about 14,000. The market share of organic products is still very low, however, at about 0.5 per cent of the total food market for the EU as a whole. Nevertheless, it has been estimated that market share of organic products will increase to 2.5 per cent by the year 2000.

In the United States, production of organic foods increased by about 20 per cent per year between 1989 and 1995, in line with the growing demand for those products. While the number o organic certified organic farmers increased from 2,841 in 1991 to 4,060 (a 43 per cent increase), the number of certified processors and distributors handling organic foods more than doubled in the same period, from 254 to 526. Organic market outlets are being increasingly diversified to meet the growing demand for organic foods.

Box 4. Successful implementation of IPM in Ghana

Successful implementation of policies and programmes aiming at SARD in developing countries require that they benefit farmers as well. The example of Ghana shows how IPM programmes successfully are achieving that goal.

Intensification of rice-farming systems in Ghana for meeting the increasing demand for food posed a high risk of new pest problems. To cope with that situation, the national Government took steps to revise national agriculture policy by declaring IPM a national policy for crop protection, abolishing subsidies on pesticides, and developing legislation to strengthen the environmental protection control over pesticide importation and use. With those policy changes and government initiatives, a four-month IPM training of trainers course was conducted for a total of 28 extension officers, and three season-long farmer's field schools were provided to 75 farmers, of whom 15 were women. The process started with analysing agro-ecosystems, comparing crops grown under the conventional inputs package with crops produced with IPM methods. The crop protection trials conducted under those two categories resulted in a 32 per cent higher return in the IPM case, with typical cost savings equivalent to around US$ 100 per farm. Farmers were also able to understand how the traditional practice of using chicken manure in alkaline soils that they were already practising was a scientific way of dealing with the problem.

23. A number of international non-governmental organizations have been very active in promoting SARD. The International Federation of Agricultural Producers adopted a number of SARD policies at its recent World Assembly, and is proposing action to strengthen farmers' organizations and links among farmers, researchers and extension services. The International Federation of Organic Agricultural Movements is developing and promoting an international organic standard system to maintain the productive capacity of the soil. The Pesticides Action Network is undertaking advocacy and field work to reduce dependence on chemical pesticides by promoting sustainable agriculture. The World Sustainable Agricultural Association has organized conferences on sustainable agriculture in Asia and South America. At the same time, informal networking arrangements have multiplied in the non-governmental organizations world as an effective and flexible way of exchanging experience across national and regional frontiers.

IV. UNFULFILLED EXPECTATIONS

24. The implementation of agriculture and rural development objectives during the five-year post-UNCED period is still far from satisfactory. The elaboration of comprehensive rural policies that bring together production, environmental and rural welfare objectives has for the most part not been achieved. The Organisation for Economic Cooperation and Development (OECD) group of countries have made some progress towards integrating agricultural and environmental policies, delinking agricultural support from production incentives and

promoting sustainable agricultural practices. However, environmental improvement is still highly dependent on market forces: low prices on world markets and high stock levels often determine land set-aside measures, leading to less intensive and more environmentally friendly production systems. The importance of non-farm, industrial-promoting policies for employment, especially for areas of lower agricultural potential, is not well reflected in rural development and environment strategies. The possibilities for small-scale organic systems are constrained by the lack of biomass, mixed (crop/livestock) systems, labour supply and economic incentives. There is often a lack of coherence between agricultural and environmental policies. In addition, different government authorities with different mandates and interests are involved in implementing SARD at the country level.

25. As emphasized by the Rome Declaration on World Food Security and the World Food Summit and Plan of Action, many developing countries face continuing challenges of poverty and hunger, highly inequitable access to land and production inputs, and a need for environmental protection. Little progress will be made towards achieving SARD without a radical reduction in the numbers of undernourished people, in a wide variety of countries and ecological settings and in a relatively short period. Hence, the coexistence of poverty, hunger and environmental degradation still makes achieving SARD an elusive target. Lack of proper financing mechanisms for rehabilitating degraded lands has also aggravated the problem.

26. The share of agriculture in total official development assistance (ODA) has declined. In terms of constant 1990 dollars, external assistance to agriculture fell from about $19 billion in 1986 to only $10 billion in 1994. Although development banks and other donors are reorienting their investing strategies towards SARD, the scale of international funding is still well below the levels required to fulfil the expectations raised by chapter 14.

27. As mentioned above, there has been notable progress made in the institutional aspects of genetic resources for food and agriculture; there has been less progress, however, in developing networks of in situ PGRFA in protected areas and early-warning mechanisms. The process of revising the International Undertaking on PGR has been hampered by the lack of financial commitment to the Undertaking. Major challenges remain in instituting mechanisms for the conservation and utilization of animal genetic resources at the national and local levels.

28. The low levels of energy inputs for productive activities in rural areas is at the root of low agricultural productivity, continued human drudgery and increasing marginalization of the poorest of rural populations, particularly in Africa. Similarly, institutional and policy weaknesses and the increasing reliance on market forces are having a negative effect on energy investments in rural areas: rarely are the latter commercially viable. That situation, which has been further compounded by the phasing out of subsidies and other developmental and promotional tools, explains the relative stagnation of investment in rural electrification programmes.

V. EMERGING PRIORITIES

29. An important issue is the need to focus on men and women farmers. Their involvement in technology development, policy formulation and investment decisions, as well as their participation in seeking solutions to technical and socio-economic problems, is vital. Out of that appreciation flow at least four priorities:

(a) The need to develop a stronger focus on farmers' and rural workers' organizations as a means to transform rural societies with an SARD focus;

(b) The need to provide appropriate opportunities and incentives for the full and effective participation of women in SARD programmes and projects, by, inter alia, developing legal measures and administrative regulations to improve their secure access to land and credit, using public awareness campaigns to remove social and attitudinal constraints, and ensuring equal access of women and men to education, training and extension services;

(c) The need for farmer-centred, participatory approaches, such as farmers' field schools that have proved successful in promoting IPM, may be used to promote other SARD-oriented technologies, such as integrated plant nutrition;

(d) The need to stress indigenous knowledge and technology, which are often the best option for the local environment, and should be carefully recorded and assessed.

30. Greater attention needs to be given to sustainable intensification. The use of environmentally friendly technologies to intensify production on already high-potential land already converted to agriculture is preferable to converting more marginal fragile land and valuable forests to low productivity or shifting agriculture. Such development may be facilitated by increasing population densities that allow the higher labour inputs that intensification demands and the access to markets and inputs that are often required.

31. Emergency situations and disasters, both natural and - especially - man-made, are a major enemy of SARD. They undermine food security, widen and deepen poverty, and may lead to immeasurable environmental damage. Disaster preparedness - early warning, early action and rapid rehabilitation following relief - is part of the SARD agenda.

32. Urban and peri-urban intensive agriculture provides opportunities for sustainable, small-scale, poverty-reducing and nutrition-improving systems as a complement to but not as a substitute for better linking urban food demand with rural supply.

33. In the important area of genetic resources for food and agriculture, a number of priorities are shifting, with a resulting need to adjust key objectives for PGR: from increasing the number of gene banks to ensuring better maintenance of existing ones and regulation of access; from ex situ collection and conservation to on-farm and in situ conservation; from highly uniform cultivated varieties to locally adapted crop varieties and crop diversification; from free to regulated access; from ad hoc activities to developing economic

analytical methods to internalize the costs of conservation into costs of production; and from sophisticated biotechnologies to differentiated, appropriate biotechnologies and local technologies. Also, following the Fourth Technical Conference on PGR, there is a need, under the guidance of the FAO Commission on Genetic Resources for Food and Agriculture, to follow up on, evaluate and prioritize the implementation of the Global Plan of Action. There is also a critical need to widely recognize that farm animal genetic resources are under serious threat and are essential for the sustainable development of most production environments. Implementing the Global Strategy is essential.

34. The situation of low fertilizer application rates and low productivity, coupled with evidence of nutrient mining, is found in much of the sub-humid rain-fed areas of sub-Saharan Africa. A strategy of merely promoting fertilizer use will inevitably lead to the exclusion of many resource-poor farmers, given the severe supply-side problems that they face. Past programmes proposed more self-reliant plant-nutrition strategies but failed to consider links to the cycling and use of the organic materials to which farmers have access. To move out of a low-productivity, low-input cycle, it will be necessary to combine the external sources of nutrient inputs with management practices to increase soil organic matter.

35. Since rural energy problems persist and energy is not playing its full role as a motor for rural development, the following issues have emerged as complementary priorities or as new areas of focus: (a) more emphasis on the micro or household level; (b) renewed interest in eco-village projects, solar villages etc.; (c) promotion of innovative financial schemes to promote small businesses; and (d) emphasis on the impact of rural energy on agricultural productivity.

36. In some situations, the efficient utilization of existing resources, channelling of information and protection of indigenous skills and technologies may be more important than extrabudgetary resources. While financing is an important issue, in some situations more coherent SARD-oriented policies and the use of existing knowledge may have equal or greater relevance to improving food security and protecting the natural environment - the two key components of SARD.

37. The continuing revolution in information technology offers exciting opportunities for promoting SARD. Increasing accessibility to computers and electronically transmitted information permits ever more rapid and wider sharing of knowledge and experience; the Domestic Animal Diversity Information System is just one example. The future challenge is to harness those opportunities effectively and convert much of the task into a virtual system of information generation, capture and exchange.

Notes

[1] See Report of the United Nations Conference on Environment and Development, vol. I, Resolutions Adopted by the Conference (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

UNITED
NATIONS

E

Economic and Social Council

Distr.
GENERAL

E/CN.17/1997/2/Add.14
21 January 1997

ORIGINAL: ENGLISH

COMMISSION ON SUSTAINABLE DEVELOPMENT
Fifth session
7-25 April 1997

Overall progress achieved since the United Nations Conference on Environment and Development

Report of the Secretary-General

Addendum

Conservation of biological diversity*

(Chapter 15 of Agenda 21)

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*The report was prepared by the United Nations Environment Programme (UNEP), as task manger for chapter 15 of Agenda 21, in accordance with arrangements agreed to by the Inter-Agency Committee on Sustainable Development (IACSD). It is the result of consultation and information exchange between United Nations agencies, international and national and non-governmental organizations, interested government agencies and a range of other institutions and individuals.

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I. KEY OBJECTIVES

1. The present report reviews progress made in the implementation of the objectives set out in chapter 15 of Agenda 21 (Conservation of biological diversity),1/ taking into account the decisions taken by the Commission on Sustainable Development on that subject at its third session, in 1995. The objectives and activities recommended in chapter 15 of Agenda 21 are to improve the conservation of biological diversity and the sustainable use of biological resources. The objectives related to the conservation of biodiversity are also addressed in the various provisions of the Convention on Biological Diversity and other related agreements.

2. The key objectives of chapter 15 of Agenda 21 concern the wide ratification and implementation of the Convention on Biological Diversity and related agreements, and action plans will go a long way towards meeting those objectives. At its third session, in April 1995, the Commission on Sustainable Development stressed that the conservation of biological diversity and the sustainable use of its components cut across a wide spectrum of sectoral and cross-sectoral issues addressed in Agenda 21, and that the extent to which developing country Parties effectively implemented their commitments under the Convention would depend on the effective implementation by developed countries Parties of their commitments related to financial resources and the transfer of technology. The Commission recognized that the Convention provides a principal mechanism for advancing the objectives of chapter 15.

II. SUCCESSES

3. The objectives of chapter 15 of Agenda 21 and those of the Convention on Biological Diversity, which came into force on 29 December 1993, set the stage for intensive action and consultation, creating an opportunity for cooperation among Governments, intergovernmental and non-governmental organizations, national and regional institutions, communities, target groups and individuals in the area of the conservation of biological diversity and the sustainable use of biological resources.

4. The Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) has been established pursuant to article 25 of the Convention. The main task of that body is to provide the Conference of the Parties with scientific advice in order to facilitate the implementation of the Convention. The main issues that have emerged during SBSTTA sessions have been detailed technical issues, such as how to promote access to and transfer of technology, the development of monitoring systems and assessments, and issues dealing with agricultural, terrestrial, marine and coastal biodiversity and traditional knowledge.

5. Article 39 of the Convention appointed, on an interim basis, the Global Environmental Facility (GEF) to develop operation programmes based on ecosystems, using Conference of the Parties guidance and criteria of species diversity, endemism and degree of threat. Initially, those long-term operational programmes will focus on arid and semi-arid ecosystems. Their goals include progress in securing global biodiversity objectives and providing a framework for the design and implementation of national actions involving the

coordination of international, intersectoral and inter-agency activities. In 1995, the GEF Council approved US $24 million for the small grants programme. In that programme, which is mainly focusing on community-based activities, 147 grants have been approved within the area of biodiversity. A clearing-house mechanism to promote technical and scientific cooperation was launched by the Convention secretariat in 1996.

6. The second meeting of the Conference of the Parties to the Convention, held in 1995, marked the beginning of the implementation of the principles of the Convention. A framework for global action was adopted that promotes support for and cooperation with other international bodies, and the development of a programme of work for the Convention process.

7. The Convention is evolving as a policy guidance body that seeks to promote action through existing institutions, as illustrated by the focus of decisions on framework programmes and guidance statements. The ability of the Conference of the Parties to the Convention to monitor its implementation will be enhanced by the analysis of national reports submitted by parties from 1997 on and the periodic publication of the Global Biodiversity Outlook.

8. The third meeting of the Conference of the Parties, held in November 1996 at Buenos Aires, highlighted the critical areas shared by the Convention and the objectives of sustainable development outlined in chapter 15 of Agenda 21.

9. A permanent secretariat has been established to ensure the effective implementation of the Convention under the guidance of the Conference of the Parties, and has commenced its work. National, regional and international initiatives in response to the various objectives of the Convention and chapter 15 of Agenda 21 have been made. Capacity-building to address scientific, technical, social and economic issues has been and continues to be instituted, and policy and legislative responses to the Convention have been or are in the process of being put in place.

10. The secretariat of the Convention is collaborating and cooperating with relevant United Nations entities, such as UNEP, the Food and Agriculture Organization of the United Nations (FAO), the United Nations Educational, Scientific and Cultural Organization (UNESCO), the United Nations Conference on Trade and Development (UNCTAD), the United Nations Development Programme, the World Meteorological Organization, the World Trade Organization and the World Bank, as well as international non-governmental organizations, such as the International Union for Conservation of Nature and Natural Resources - World Conservation Union (IUCN) and the World Wide Fund for Nature, in organizing training activities and regional meetings aimed at capacity-building and human resources development on the subject of biodiversity conservation and sustainable use.

11. As a cooperative activity of UNEP, the World Resources Institute (WRI) and IUCN, a set of guidelines on the preparation of biodiversity strategies and action plans was prepared and global biodiversity forums were organized to assist Governments and the public in integrating biodiversity components in improving the understanding of the role of biodiversity in sustainable development and in monitoring implementation and the reporting of progress made.

12. Many United Nations entities and non-governmental organizations have strengthened their activities on the economics of biological diversity so as to promote the use and development of economic instruments supportive of the implementation of the objectives of chapter 15 of Agenda 21 and the Convention on Biological Diversity.

III. PROMISING CHANGES

13. With the Convention now entering its second phase and the guidance of the Commission, it is anticipated that Governments will move to integrate the conservation of biological diversity and the sustainable use of biological resources into national development plans and sectoral policies. National reports on country activities on biodiversity are due by 1 January 1998. As implementation gains momentum worldwide, Governments will increasingly recognize the importance of the conservation of biological diversity and the sustainable use of biological resources to their political agenda for socio-economic development.

14. The Seville Strategy on Biosphere Reserves adopted by UNESCO, the FAO Report on the Status of the World's Plant Genetic Resources, and the Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture adopted at the International Technical Conference on Plant Genetic Resources (Leipzig, 1996) have together focused worldwide attention on the contribution of the Global Network of Biosphere Reserves and the Global Plan of Action on Plant Genetic Resources to the implementation of the Convention on Biological Diversity.

15. The Intergovernmental Panel on Forests, in the consideration of its 11 priority issues, has included the conservation and sustainable use of biological diversity in a cross-sectoral manner. The progress made in integrating relevant biodiversity concerns in all the forests priority issues of the Panel's programme of work was duly reflected in the reports of the Secretary-General to the Panel at its third session (Geneva, 9-20 September 1996). Areas of the Panel's work programme identified as the most relevants ones for integrating forest and biodiversity are national forest programmes; underlying causes of deforestation; traditional forest-related knowledge; trade in forest products and services; valuation of the multiple benefits of forests; qualitative forest assessment; and criteria and indicators for forests sustainability. Both the Panel and Conference of the Parties to the Convention have recognized the importance of the fruitful cooperation and mutually supportive working relation established between the two intergovernmental processes.

IV. UNFULFILLED EXPECTATIONS

16. Although Governments, relevant United Nations bodies, non-governmental organizations and major groups, among others, have made great strides in meeting the formidable challenges inherent in the implementation of objectives and activities contained in the Convention and hence chapter 15 of Agenda 21, there are a number of key areas in which expectations remain unfulfilled, including (a) insufficient new and additional financial resources; (b) transfer of technologies for conservation and sustainable use of biological diversity;

(c) equitable sharing of benefits; (d) failure to integrate biodiversity into sectoral plans and national systems of accounts; (e) lack of incentives at the national, regional and global levels; and (f) rehabilitation and restoration of degraded ecosystems.

17. The insufficiency of new and additional financial resources envisaged under the Convention has had its telling effects on the efforts of all stakeholders in the field of biodiversity conservation and the sustainable use of genetic resources, particularly in developing countries. Part of the problem is insufficient national capabilities (human, technical and financial capabilities), so that its solution will require strengthening such capabilities.

18. It was expected that a permanent institutional structure for operating the financial mechanism under the Convention would be decided upon at the second meeting of the Conference of the Parties in Jakarta. The Conference of the Parties decided that the restructured GEF should continue, on an interim basis, to serve as the institutional structure on an interim basis, and in its decisions II/6 and II/7 instructed GEF to facilitate urgent implementation of articles 6 and 8 of the Convention by making available to developing country Parties financial resources for projects in a flexible and expeditious manner. It is hoped that the issue of replenishment of GEF and the level of funding by developed country Parties will meet the expectations of the Conference of the Parties for new and additional financial resources for the conservation and sustainable use of biological diversity.

19. Transfer of technologies relevant for the conservation and sustainable use of biological diversity continues to be a major area of unfulfilled expectations of most developing country Parties, who require those technologies in order to make use of their genetic resources sustainably without causing damage to the environment.

20. The failure to integrate biodiversity concerns into sectoral plans and national systems of accounts has hitherto been attributable to the lack of comprehensive methodologies for that purpose. However, significant progress is anticipated in that area, as more and more countries develop their national biodiversity strategies and action plans using the new UNEP/WRI/IUCN biodiversity planning guidelines. Considerable emphasis is laid in those guidelines on the need for incorporating appropriate incentive measures to underpin in situ and ex situ biodiversity conservation and its sustainable use, and to recognize and reward efforts by local and/or indigenous populations adjacent to protected areas.

21. Countries are still a long way from attaining the objective of providing incentive measures to enhance local benefits from biodiversity, including establishing secure property or use rights; providing education and relevant technologies; providing compensation for damage to crops, livestock and other property damaged by wild animals/predators; involving local communities in biodiversity management; and providing endowment funds or other financial mechanisms that ensure predictable and secure sources of income, such as user fees, franchises, land-use taxes and bonds.

22. The restoration and rehabilitation of habitats, which depend on the availability of material and its multiplication ex situ, will come to play increasingly major roles in re-establishing the integrity of degraded and damaged ecosystems. Expectations were high in the minds of the negotiators of the Convention regarding the possible rehabilitation and restoration of degraded and damaged ecosystems through the application of ecological principles and science and technology. The mounting pressure on existing ecosystems and the threat of their further degradation, however, gives much cause for alarm in view of the apparent inaction on already degraded ecosystems. Part of the problem is attributed to the absence of adequate national and regional capacities to deal with the problem in terms of the expert human resources required, including the need for technical, technological and infrastructural requirements.

23. Capacity-building initiatives would help, and the Conference of the Parties to the Convention, at its third meeting, directed GEF to address that issue. Committed trainers, educators and skilled people are the key to the successful maintenance and sustainable use of biodiversity. To build adequate and effective national capacity and expertise, there is a need to reorient the thrust of current training programmes. An essential element in the training of the next generation of professionals will require a new focus on the broader aspects of resources management and the critical role of maintaining adequate levels of biodiversity in conjunction with the management of forestry, fisheries and agriculture. Training of more skilled scientists must be provided for those developing and safe-guarding ex situ and in situ facilities of all kinds.

V. EMERGING PRIORITIES

24. Over the years since the United Nations Conference on Environment and Development, a number of issues have emerged requiring urgent resolution in order to firmly secure the gains made in the field of biodiversity, including (a) focus on marine and aquatic biodiversity issues; (b) the crucial role of forests in conserving biological diversity; (c) greater awareness/advocacy for benefit sharing and equity; (d) biosafety issues; (e) the need for understanding ecosystem functioning; (f) the crucial role of biodiversity economics; (g) the FAO Undertaking on Plant Genetic Resources; (h) implementation of environmental impact assessments, taking into account relevant socio-economic and cultural aspects; (i) a greater role for private sector involvement; and (j) the importance of the precautionary approach and the users pay principle.

25. Recognition of and reward for traditional knowledge and practices of local communities and indigenous people, the role of women in the biodiversity arena, and the responsibility of the relevant private-sector entities have all generated a great deal of scope and hope for more effective means to provide incentives for conservation and the sustainable use of biodiversity and its components.

26. Issues of biosafety have emerged with regard to national capacity needed for the implementation of effective in situ conservation measures, through establishing and maintaining the means to regulate, manage or control risks associated with invasive species and/or the use and release of living modified organisms resulting from biotechnology and likely to have adverse environmental impacts on the conservation and sustainable use of biological diversity. The

biosafety issue, in particular the public perception of the impact of biotechnology research, development and applications, is receiving due global attention and global consensus is building rapidly.

27. A greater understanding of ecosystem functioning through research and monitoring is needed not only with respect to the impact of invasive species and modified living organisms on the environment but also, as noted above, for the formulation, adoption and implementation of appropriate strategies and action plans that integrate the various biodiversity values of the ecosystems into the national development plans and sectoral policies.

28. The critical importance of integrating various biodiversity values for conservation and sustainable use has made biodiversity economics an especially challenging subject for the estimation of benefits derived from biological resources. Measuring the economic values of biological resources demands a great deal of information and appropriate methodologies. Application of such methodologies will shed more light on the socio-economic and scientific/ ecological aspects of the ecosystems valuation, and will benefit all stakeholders in their various biodiversity-related pursuits. It is important to demonstrate through biodiversity economics the relationship between economics, international trade and biodiversity to enable national Governments, local communities and the private sector to capture and share equitably the benefit of economic incentives for the sustainable use of genetic resources. The globalization of the economy and liberalization of markets should not lead to negative impacts in economics or the ecology of nations. Another relevant development in this regard is the UNCTAD BIOTRADE Initiative, which can be seen as a contribution in the area of economic valuation and economic incentive measures for promoting the conservation and sustainable use of biological diversity.

29. The need to conserve the biotic wealth of aquatic ecosystems and the principles for doing so are less appreciated than for terrestrial ecosystems. The conservation and sustainable use of marine and aquatic biodiversity that lags decades behind is an emerging issue under the Convention on Biological Diversity and the Programme of Action for the Sustainable Development of Small Island Developing States that requires a major focus globally.

30. Carrying out environmental impact assessments (EIAs) of proposed projects, programmes and plans likely to have significant adverse effects on biological diversity remains a major challenge, and is an issue that is attaining increasing importance for decision makers and those responsible for implementing policy. The economic challenge in managing biodiversity is to balance the benefits derived from sustainable resource use/conservation against the social and other costs caused by unsustainable use or non-use. The challenge to policy makers and those responsible for implementing policy is to develop institutional capacity for EIAs as well as to develop, adopt and apply methodologies that will confront resource users with the full social costs of their current or intended activities. A wide variety of sectors that have not hitherto examined the implications or consequences of their activities upon conservation and the sustainable use of biodiversity must be subjected to EIAs to determine environmental, economic and social costs and benefits.

31. A greater role for private-sector involvement in the sustainable use of biodiversity is emerging, and calls for priority attention by Governments in their efforts to address the issues of poverty and inequitable distribution of income and assets, both of which are causes and consequences of biodiversity loss and/or overexploitation. Private-sector participation is important in the formulation of economic and financial policies that could help address or redress market failures by capturing for the nation and its local populations the benefits from goods and services derived from biodiversity, especially biotechnology, which holds great promise for increasing the benefits from biodiversity. Cooperation and corporate responsibility of the private sector in acknowledging and addressing public concerns over unintended consequences of technological applications, including biotechnology, are essential for the success of economic and financial policies of Governments, including the implementation of transparent EIAs on proposed projects.

Note

1/ See Report of the United Nations Conference on Environment and Development, vol. I, Resolutions Adopted by the Conference (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

UNITED NATIONS

E

Economic and Social Council

Distr.
GENERAL

E/CN.17/1997/2/Add.15
21 January 1997

ORIGINAL: ENGLISH

COMMISSION ON SUSTAINABLE DEVELOPMENT
Fifth session
7-25 April 1997

Overall progress achieved since the United Nations Conference on Environment and Development

Report of the Secretary-General

Addendum

Environmentally sound management of biotechnology*

(Chapter 16 of Agenda 21)

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* The report was prepared by the United Nations Industrial Development Organization (UNIDO) as task manager for chapter 16 of Agenda 21, in accordance with arrangements agreed to by the Inter-Agency Committee on Sustainable Development (IACSD). It is the result of consultation and information exchange between United Nations agencies, international and national organizations, interested government agencies and a range of other institutions, individuals and major group representatives.

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INTRODUCTION

1. The present report reviews progress made in the implementation of the objectives set out in chapter 16 (Environmentally sound management of biotechnology) of Agenda 21,[1] taking into account the decision taken by the Commission on Sustainable Development on that subject at its third session in 1995. Those objectives are set out relative to the following five programme areas: (a) increasing the availability of food, feed and renewable raw materials; (b) improving human health; (c) enhancing protection of the environment; (d) enhancing safety and developing international mechanisms for cooperation; and (e) establishing enabling mechanisms for the development and environmentally sound application of biotechnology.

2. Biotechnology can contribute to sustainable development by improving food production and feed supply, health care and environmental protection. Information provided by national Governments to the Commission shows that many developed and developing countries are undertaking efforts in biotechnology research and development and are establishing policies related to the sustainable use and management of biotechnologies. The number of private-sector companies involved in biotechnology research and development or showing a vital interest in its results is growing.

Box 1. Interests of countries in biotechnology use is growing

In 1995, the Health and Safety Executive of the United Kingdom of Great Britain and Northern Ireland had notification of 470 centres that are carrying out activities involving the contained use of genetically modified organisms. There are also many large and multinational companies with substantial interests in biotechnology, and in addition about 150 small and medium-sized enterprises whose operations are based on biotechnology research and development.

Between 1984 and 1993, the National Centre for Genetic Engineering and Biotechnology of Thailand allocated US$ 9 million to university research and development in biotechnology, inter alia, to support the use of biopesticides and reduce the use of chemical fertilizers by promoting the use of biofertilizers.

3. Several United Nations bodies and other international organizations have strengthened their biotechnology and related support programmes or developed new initiatives to assist efforts being undertaken by developing countries and economies in transition. Through cooperation programmes, the access of those countries to biotechnology information and applications has improved, and the adaptation of biotechnological solutions to the conditions of particular clients has been facilitated.

4. The increasing recognition that biotechnology can provide solutions for many problems fundamental to sustainable development makes it essential to

establish national legislation to ensure the adequate protection of human health and the environment in connection with the contained use and release of genetically modified organisms resulting from modern biotechnologies. Moreover, it calls for internationally agreed guidelines or principles of risk assessment and risk management to be applied in the development, transboundary movement and use of biotechnology solutions.

I. PROGRESS ACHIEVED IN THE IMPLEMENTATION OF THE OBJECTIVES OF THE SELECTED TWO PROGRAMME AREAS

5. Consistent with the conclusions of inter-sessional meetings on issues related to the environmentally sound management of biotechnology, and the decisions on biotechnology adopted by the Commission at its third session, in 1995, progress in two programme areas is reported on below.

A. Establishing enabling mechanisms for the development and environmentally sound application of biotechnology

6. Important for the sustainable use of biotechnologies is the establishment of an effective and transparent national decision-making structure to deal with the legal and policy issues related to the safe and sound management of biotechnologies. An increasing number of countries have developed or are in the process of developing regulatory oversight systems for biotechnology applications that contain guidelines or principles on biotechnology risk assessment and risk management. In order to take account of public concerns relative to safeguarding environmental health and safety in the use of modern biotechnologies, efforts are being made to ensure active participation by the public at large in the discussion on and implementation of those policies.

Box 2. Establishing biosafety mechanisms at the national level

The purpose of the Finnish Gene Technology Act is to promote the safe and ethically acceptable use of gene technology. The legislation contains principles on biotechnology risk assessment and management. Consultations with public and private-sector groups and with communities is a key feature.

In Brazil, specific legislation was sanctioned in 1995 and a number of biosafety regulations were adopted related to biosafety in laboratories and the release of genetically modified organisms into the environment. In order to enhance awareness and transparency several TV programmes are devoted to the potential benefits and risks arising from the application of biotechnology, taking into account ethical and cultural considerations.

Malaysia's biosafety guidelines to control the release of genetically modified organisms and biotechnology products are in the final stage of preparation. Mass media, including newspapers, TV and radio, are actively involved in awareness-raising and education of the public on biosafety issues.

7. The ways and extent to which government policy is used to support or promote biotechnology vary considerably among countries. In developed countries, policy instruments are mainly aimed at strengthening the competitive positions of those countries in the area of biotechnology, and involve science and technology, industrial, trade and economic policy, and government interaction with the private sector. In view of international competition Governments are increasingly becoming willing to intervene in the market. In the majority of developing countries, the question of national policy for biotechnology is singularly important. In many instances, policy initiatives are already being undertaken with varying degrees of success.

8. A major policy challenge concerns the ability to be selective in the promotion of biotechnology so as to optimize social and economic returns on scarce resources in ways that are compatible with overall economic policies and development strategies. Policy makers in developing countries are faced with the dilemma of choosing between long-term solutions through technology transfer and capacity-building, including through cooperative arrangements with developed countries, and short-term solutions utilizing conventional methods and improvements of their information and management practices.

9. Essential for success in developing capabilities in the safe and sound use and management of biotechnologies appear to be the establishment of relevant research and development programmes, fostering research potential through a steady supply of qualified personnel, making investment capital available and providing private-sector incentives to invest in biotechnology.

Box 3. Capacity-building in biotechnology

The University of Havana, Cuba, offers postgraduate studies in biosafety, and a number of universities in Bolivia implement training programmes in biotechnology. Malaysia is making available research and development results in biotechnology produced in public institutions to the private sector at no cost in order to strengthen the linkages between research and development activities and the commercialization of biotechnologies, and to encourage collaboration between the public and private sectors.

10. Lack of human and material resources can to some extent be compensated through building up research networks as a means of increasing critical mass. Extensive use of communication and multimedia technologies can enhance the effectiveness of such networks, and in addition can provide a cost-effective means of upgrading scientific and technological skills.

11. Facilitator mechanisms effecting the transfer of proprietary technologies to public and private institutions in the developing world are also likely to have significant impacts on upgrading scientific and technological capacity.

12. Intellectual property rights and biosafety play a key role in building long-term competitive advantage. National policies to protect proprietary rights in intellectual property are important to stimulate research and

development in biotechnology, attract private-sector investment and promote biotechnology transfer, while ensuring that public health and environmental safety are not compromised.

13. At the international level, aid programmes have reduced their commitment to the development of long-term training and research efforts in the agricultural and medical sectors. Hence, the success of international programmes depends on ensuring that the cycle of market research, priority setting, strategic and applied research, technology transfer and feedback remains operative.

B. Enhancing safety and developing international mechanisms for cooperation

14. The need for further efforts leading to international agreement on principles to be applied in risk assessment and the management of all aspects of biotechnology is widely recognized. The report of the European Community to the Commission on Sustainable Development at its third session, for example, stated that only when adequate and transparent safety and border-control procedures are in place will the Community at large be able to derive maximum benefit from and be in a better position to accept the benefits and risks of biotechnology. A considerable number of non-governmental organizations, women groups and indigenous people in both developed and developing countries have expressed concern that the promotion of biotechnology is quite undesirable without some international mechanism in place to protect people from possible adverse effects resulting from genetically altered foods and animals, as well as from disadvantages that a biotechnology-driven market might bring to small farmers in developing countries.

15. Disparities in the definition of regulated items and the scope of regulations and assessment procedures in different countries may potentially compromise public health and environmental safety. In some cases, it may also lead to unfair trade practices. International cooperation is therefore essential in minimizing regulatory contradictions among individual national systems and ensuring the harmonization of risk-assessment procedures to the extent possible. Such cooperative efforts are already under way. The United Nations Industrial Development Organization (UNIDO), for example, has established the Biosafety Information Network and Advisory Service. Its cooperation with the Expert Group for Harmonization of Regulatory Oversight in Biotechnology of the Organisation for Economic Cooperation and Development has resulted in the establishment of an integrated database on biotechnology regulations and risk-assessment procedures.

16. In parallel, the Conference of the Parties to the Convention on Biological Diversity, at its second meeting in Jakarta in November 1995, decided to establish an open-ended ad hoc working group of government-designated experts to develop a protocol on biosafety in the field of the safe transfer, handling and use of living modified organisms. The protocol is to have a specific focus on the transboundary movement of any living modified organism resulting from modern biotechnology that might lead to adverse effects on the conservation and sustainable use of biological diversity, and is to set out for consideration an appropriate procedure for advance informed agreement. During the Jakarta

meeting, it was also agreed that the UNEP guidelines may be used as an interim mechanism during the development of the protocol and to complement it after its conclusion. An open-ended ad hoc working group of experts established under the Convention on Biological Diversity met for the first time at Aarhus, Denmark, from 22 to 26 July 1996, to discuss the elements and structure of the protocol.

Box 4. Initiative of the United Nations Environment Programme (UNEP) on international biosafety guidelines

A UNEP-led initiative resulted in the adoption of the International Technical Guidelines for Safety in Biotechnology by a global consultation of government-designated experts held at Cairo in 1995. The Guidelines were formulated on the basis of common elements and principles derived from relevant national, regional and international instruments, regulations and guidelines, and drew upon experience already gained through their preparation and implementation. An international workshop to follow up on the Guidelines, which was held in Buenos Aires from 31 October to 1 November 1996, adopted recommendations on capacity-building related to biosafety.

17. Finally, another notable development has been the Fourth International Technical Conference for Plant Genetic Resources, which was held at Leipzig from 17 to 23 June 1996. The Conference was convened by the Food and Agriculture Organization of the United Nations (FAO) with the intention of translating the relevant parts of Agenda 21 and the Convention on Biological Diversity into a global plan of action. The Conference resulted in a plan of action that includes some 346 recommendations derived from a background report entitled "State of the world's plant genetic resources". It also resulted in a declaration on conservation and sustainable utilization of plant genetic resources for food and agriculture. The declaration formulates general rules and principles on access to and conservation and use of plant genetic resources.

II. TRENDS RELEVANT FOR THE FURTHER IMPLEMENTATION OF THE OBJECTIVES SET OUT IN CHAPTER 16 OF AGENDA 21

18. A growing number of developing countries and economies in transition have realized the considerable scope that exists for achieving productivity gains, improvement in the quality of food and agricultural products, and conservation of the environment by using modern biotechnologies as an adjunct to existing technologies and methods. Progress is becoming noticeable particularly where efforts have been geared to channel an important part of biotechnology capacity-building towards the effective exploitation of existing knowledge. That in no way diminishes the need for developing countries to build domestic skills and capabilities in the biosciences; on the contrary, it is in countries that have the strongest science and technology base that the use, assimilation and adaptation of existing knowledge becomes part of the cumulative learning process leading to upgrading their research and development capability.

19. A number of countries have achieved significant progress through the successful implementation of industrial and technology policies. For example, the Asian newly industrialized countries have been particularly skilful in deploying industrial policy to promote commercial biotechnology. They use grants, direct capital investment and fiscal stimulants, and support skill-building and downstream development. Some countries have made systematic use of foreign technology licensing and the repatriation of scientists trained abroad to strengthen their relatively weak research bases. In Latin America, most Governments have tended to confine their activities to research and development support. Although some of the larger countries are beginning to develop more comprehensive approaches to bio-policy, it will be some time before that shift begins to have an impact on society and the economy.

20. Genome research in key species has generated a large amount of information and spin-off technologies in the public domain that are increasingly being utilized in target-oriented research relevant to developing countries. In parallel, the proliferation of electronic information accessible on the Internet is beginning to have major beneficial impacts on research and education.

21. At the international level, in vitro micropropagation and recombinant DNA technologies for the conservation and exchange of genetic diversity of crops important to the developing world have already been transferred to national programmes, mainly through Consultative Group on International Agricultural Research centres. Similarly, genetic engineering has been successfully deployed in research programmes for diagnostics, drug and vaccine development of the World Health Organization; the International Green Cross; the UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases; and the International Centre for Genetic Engineering and Biotechnology.

III. CONSTRAINTS AND UNFULFILLED EXPECTATIONS

22. To date, in many developing countries, the actual contribution that biotechnology can make to solve fundamental problems of development and environment remain below the expectations foreseen by the United Nations Conference on Environment and Development. As for the ground-level social benefits of biotechnology, they have yet to make themselves widely felt; that is not surprising, however, in view of the fact that health care and agricultural biotechnology are only now appearing in the market place, even in the industrialized world.

23. A considerable number of developing countries still lack the level of biotechnology capacity required to undertake research and development in biotechnology or to fully benefit from biotechnological solutions available in the market. The obstacles to building up biotechnology capability and capturing its social and private returns still remain in most developing countries. Early expectations that biotechnology would make a significant contribution to achieving sustainable development while safeguarding the environment are being fulfilled only slowly. Constraints include: (a) scarcity of human and financial resources; (b) low institutional capacity; (c) lack of coherent realistic policies in some countries, and on occasions lack of political will; and (d) inadequate awareness and understanding of the potential benefits and

risks of the technology, as well as of the requirements for its environmentally sound management.

24. The observable reduction of international funding for research and programmes addressing problems of the developing world is a trend affecting many sectors. Indeed, available information indicates levels of financial support far below those that are minimally required to enable developing countries to participate in and benefit from the use of biotechnology.

25. There is growing concern among several developing countries about the increasing interest of foreign private companies in using the knowledge of indigenous people for private gain. They argue that the Trade-Related Intellectual Property Rights provisions of the World Trade Organization work to the advantage of private companies and laboratories, who are able to commercialize such products as medicine or seeds based on the knowledge of indigenous people or communities. On the other hand, intellectual property rights systems deny protection to the knowledge and innovations of indigenous people or communities because it is deemed to be in the public domain and therefore to be freely available. Accordingly, the need to safeguard private investment through strong intellectual property regimes must be compensated by workable arrangements that ensure equitable sharing of socio-economic benefits with the developing world.

26. The negotiations under the Convention on Biological Diversity on internationally agreed guidelines or principles of risk assessment and risk management to be applied in the development, transboundary movement and use of biotechnological solutions has been slow because of the differences in national interests. Some countries are in favour of limiting the scope of the proposed protocol mainly to the transboundary movement of living modified organisms. They argue that such a protocol should aim at greater harmonization of existing regulations and accept the concept of substantial equivalence. Other countries and a number of non-governmental organizations favour a broader scope, including provisions on the domestic handling and use of transgenic organisms, as well as provisions on liability and compensation resulting from malpractice.

IV. EMERGING PRIORITIES

27. Conclusion of the negotiations on a biosafety protocol under the Convention on Biological Diversity will be an important step forward. In following up its implementation at the national level, the establishment of a participatory mechanism facilitating effective and constructive interaction between the private and public institutions (industry associations, United Nations and other international bodies, non-governmental organizations etc.) aimed at considering controversial issues and resolving conflicts of interest will be useful. Such mechanism may have a profound effect in assuring public confidence and providing useful inputs, inter alia, to the Commission on Sustainable Development, the Conference of the Parties to the Convention on Biological Diversity and other international forums. In establishing such a mechanism, the experiences gained by the ad hoc working group on biosafety of UNIDO/UNEP/WHO/FAO may be useful.

28. Institutional capacity-building and networking should be promoted by national Governments to ensure the promulgation and implementation of national policies for access to genetic resources, biosafety and intellectual property protection, along with the requisite capacity for implementation.

29. Developing countries should set up mechanisms to facilitate the evaluation of research and development activities in biotechnologies and the commercialization of those technologies, as well as to assess their ecological, health and socio-economic and ethical implications in specific contexts.

Notes

[1] Report of the United Nations Conference on Environment and Development, vol. I, Resolutions Adopted by the Conference (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

UNITED NATIONS **E**

Economic and Social Council

Distr.
GENERAL

E/CN.17/1997/2/Add.16
24 January 1997

ORIGINAL: ENGLISH

COMMISSION ON SUSTAINABLE DEVELOPMENT
Fifth session
7-25 April 1997

Overall progress achieved since the United Nations Conference on Environment and Development

Report of the Secretary-General

Addendum

Protection of the oceans, all kinds of seas, including enclosed and semi-enclosed seas, and coastal areas and the protection, rational use and development of their living resources*

(Chapter 17 of Agenda 21)

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* The report was prepared by the ACC Subcommittee on Oceans and Coastal Areas, as task manager for chapter 17 of Agenda 21, in accordance with arrangements agreed to by the Inter-Agency Committee on Sustainable Development (IACSD). It is the result of consultation and information exchange between United Nations agencies, international and national science organizations,

interested government agencies and a range of other institutions and individuals.

I. KEY OBJECTIVES

1. This report reviews progress made in the implementation of the objectives set out in chapter 17 of Agenda 21 (Protection of the oceans, all kinds of seas, including enclosed and semi-enclosed seas, and coastal areas and the protection, rational use and development of their living resources),[1] taking into account the decisions taken by the Commission on Sustainable Development on this subject at its fourth session, in 1996. The overall goal of chapter 17 of Agenda 21 is to promote the sustainable utilization and conservation of the marine environment and its resources, both in the oceans and in coastal areas. Specific objectives are derived from the seven programme areas of the chapter, namely:

(a) Integrated management and sustainable development of coastal and marine areas, including exclusive economic zones;

(b) Marine environmental protection, from both land-based and sea-based activities;

(c) Sustainable use and conservation of marine living resources of the high seas;

(d) Sustainable use and conservation of marine living resources under national jurisdiction;

(e) Addressing critical uncertainties for the management of the marine environment and climate change;

(f) Strengthening international and regional cooperation and coordination;

(g) Sustainable development of small islands.

2. The sections below discuss the status of implementation of these objectives since the United Nations Conference on Environment and Development (UNCED) in 1992, and identify some emerging issues and concerns.

II. SUCCESSES

3. The concept of integrated management of watersheds, river basins, estuaries and marine and coastal areas is now largely accepted in the United Nations system and in most countries as providing a comprehensive, ecosystem-based approach to sustainable development. Guidelines for integrated coastal area management (ICAM) have been developed for various levels of governance and implementation and are being applied by countries and financing institutions in a growing number of technical assistance projects. The International Coral Reef Initiative (ICRI) and the Global Coral Reef Monitoring Network are new initiatives developed out of the concern of countries for the health of such critical coastal ecosystems as coral reefs, mangroves and seagrass ecosystems.

Secretariat with the United Nations Development Programme (UNDP) has started strengthening the capabilities of local and regional training institutions in the field of coastal and ocean management.

4. With respect to land-based sources of pollution, a major initiative was the convening of an Intergovernmental Conference in Washington, D.C. (23 October-3 November 1995) which adopted the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, subsequently endorsed by the Commission on Sustainable Development at its fourth session and by the United Nations General Assembly in resolution 51/189, of 16 December 1996. Participating States agreed that effective development and implementation of national programmes of action should focus on sustainable, pragmatic and integrated environmental management, harmonized, as appropriate, with ocean basin management and land-use plans. Regarding marine environmental protection from sea-based pollution, the International Maritime Organization (IMO) has adopted a number of new protocols or amendments to existing conventions to reduce these pollutants, including, most recently, the 1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972 (the London Convention, 1972), approved on 8 November 1996.

5. The legal framework for the sustainable use and conservation of living aquatic resources in the oceans, both in the high seas and under national jurisdiction, has been substantially improved since UNCED by the entry into force, in 1994, of the 1982 United Nations Convention on the Law of the Sea. This Convention establishes the rights and duties of States with respect to the conservation and management of resources as well as marine environmental protection. Governments have increasingly become aware of the need for conservation and management of fishery resources in the high seas as well as in the exclusive economic zones (EEZs) and have, since UNCED, adopted or voluntarily agreed to the following international instruments related to fisheries: the Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas (1993); the United Nations Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (1995); and the FAO Code of Conduct for Responsible Fisheries (1995).

6. Regarding critical uncertainties, agreement has been reached on a development approach, strategy and time-frame for the Global Ocean Observing System (GOOS), involving many national institutions and with the effective cooperation of a number of United Nations organizations (the International Oceanographic Commission (IOC) of the United Nations Educational, Scientific and Cultural Organization (UNESCO), the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP)) and other international organizations, in particular the International Council of Scientific Unions (ICSU). Several regional GOOS programmes have been initiated and there has been an increase in efforts to collect and share critical types of data. In addition, significant progress has been made in numerous scientific domains critical to the understanding of the oceans, such as (i) forecasting of ocean conditions (floods, tsunamis, cyclones) and related warning systems and protective measures; (ii) the role of oceans in relation to greenhouse gases; (iii) quantifying the vulnerability of low-lying areas to climate change and

sea-level rise; (iv) the impact of ultraviolet light on productivity; and (v) implementation of the International Mussel Watch Programme.

7. International cooperation and coordination for the sustainable use of the oceans has been actively addressed by many international, regional and national initiatives, which has helped to focus attention on the critical issues facing Governments as they develop policies for the wise management and use of their ocean and coastal areas. The recommendations reached at the London Workshop on Environmental Science, Comprehensiveness and Consistency in Global Decisions on Ocean Issues (London, 1995), co-sponsored by the Governments of the United Kingdom of Great Britain and Northern Ireland and Brazil, for example, served as a basis for the consideration of this issue at the fourth session of the Commission on Sustainable Development, in 1996. The Commission, in fact, held extensive discussions on how to improve and ensure international cooperation and coordination with regard to oceans. It recommended to the Economic and Social Council, subject to the outcome of the special session of the General Assembly in 1997, that the Commission's future work programme should include a periodic overall review of all aspects of the marine environment and its related issues, as described in chapter 17 of Agenda 21, for which the overall legal framework should be provided by the United Nations Convention on the Law of the Sea, and that the results of such a review should be considered by the General Assembly under an agenda item entitled "Oceans and the law of the sea". It further recommended that this review should draw upon reports of UNEP and other relevant United Nations bodies and international organizations, to be coordinated by the Administrative Committee on Coordination (ACC) Subcommittee on Oceans and Coastal Areas. Finally, to address the need for improved coordination, the Commission invited the Secretary-General to review the working of the Subcommittee, with a view to improving its status and effectiveness, and it also invited the executive heads of the sponsoring agencies and organizations of the Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP), to improve its effectiveness and comprehensiveness while maintaining its status as a source of agreed, independent scientific advice.[2]

8. Subsequent to the Commission's recommendation, and even prior to the fifth session of the Commission and the special session and the fifty-first session of the General Assembly, the Assembly decided in December 1996 to change its annual agenda item from "Law of the sea" to "Oceans and the law of the sea", beginning at its fifty-second session, and requested the Secretary-General to submit to that session a comprehensive report on oceans and the law of the sea in connection with its annual review and evaluation of the implementation of the Convention and other developments relating to ocean affairs and the law of the sea; the Assembly further reaffirmed its view that the problems of ocean space were closely interrelated and needed to be considered as a whole (Assembly resolution 51/34).

III. PROMISING CHANGES

9. As for many other chapters of Agenda 21, implementation of chapter 17 has certainly benefited from an increased awareness on the part of the international community of what is meant by sustainable development and global change, both from a conceptual and a pragmatic point of view. At practically all levels, the

potential of the ocean as a moderator of climate and a provider of food, transportation and recreation is being recognized as a common heritage that requires wise management and protection. Indeed, the General Assembly has recognized this importance in its decision to declare 1998 International Year of the Ocean (resolution 49/131).

10. The relatively successful implementation of chapter 17 is reflected in, and builds upon, a series of important international legal and institutional instruments which have been completed or agreed upon since UNCED. Most significant is the entry into force in 1994 of the 1982 United Nations Convention on the Law of the Sea. In addition to the list of fisheries-related instruments mentioned in paragraph 5 above, other important recent agreements include the Rome Consensus on World Fisheries adopted by the FAO Ministerial Meeting on Fisheries (Rome, March 1995); the Jakarta Initiative entitled "Conservation and Sustainable Use of Marine and Coastal Biological Diversity" (decision II/10 of the second meeting of the Conference of the Parties to the Convention on Biological Diversity) adopted in November 1995; the Kyoto Declaration and Plan of Action of the International Conference on the Sustainable Contribution of Fisheries to Food Security (Kyoto, December 1995); and General Assembly resolutions 51/34 on the law of the sea, 51/35 on the Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and 51/36 on large-scale pelagic drift-net fishing; unauthorized fishing in zones of national jurisdiction; and fisheries by-catch and discards.

11. Individually also, Governments have taken significant actions. The direct involvement of member States in support of international initiatives has been an important factor in their success. Many States have started changing their policies and adjusting their legal and institutional frameworks. Often this includes improved mechanisms for peoples' participation, independent policy overview (e.g., in fisheries) and recognition of the role to be played by macroeconomic instruments. In addition, the precautionary principle approach, called for in the Rio Declaration, is progressively being recognized and applied, for example, in fisheries where sectoral guidelines for its application have been developed. National policies are gradually reflecting references to the need to (a) increase research and systematic observations; and (b) address critical uncertainties.

12. Non-governmental organizations (NGOs) have operated as partners in promoting the concepts of sustainable development and responsible fisheries across all the above programmes. A number of non-governmental initiatives have been taken, the impact of which has still to be seen, but which have the potential of mobilizing further energies in favour of improved ocean management. One example is the Independent World Commission on the Oceans, which was established in 1995 with the view to promoting integrated management of the oceans. Attempts are also being made to use consumers' power to promote sustainable fisheries through the establishment of eco-certification of fishery management systems and eco-labelling of fishery products by the Marine Stewardship Council (to be established in 1997) and/or other existing certification systems (e.g., ISO 9000 and 14000).

13. The experience of the United Nations system with the private sector and NGOs (e.g., IMO in the area of shipping, FAO in fisheries, UNESCO/IOC in research) has been very positive and signs of willingness to cooperate further are evident. Moreover, the development of action plans and cooperative programme frameworks for integrated management (e.g., of coastal areas), should offer more opportunities for involvement of the private sector in the intersectoral management of natural resources.

14. Continuation of the long-standing cooperation within the United Nations system dealing with oceans, reinforced by the creation of the Subcommittee on Oceans and Coastal Areas of the Administrative Committee on Coordination, has been a critical factor of success in these endeavours. The recent agreement of the Subcommittee, despite the limited resources available to participating organizations, to operate as an inter-agency facilitating mechanism for the implementation of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities is a further step in system-wide cooperative efforts and could prove essential for the success of the Programme of Action. Inter-agency cooperation will also be important in the United Nations preparations for the 1998 International Year of the Ocean.

15. In the critical cross-sectoral area of financing, it should be noted that the Global Environment Facility (GEF) adopted an Operational Strategy in 1994, within which the international waters and biodiversity components are of particular importance for chapter 17. The role of GEF as a funding mechanism to provide grants and concessional funds to developing countries and countries with economies in transition will be an essential element in inter-agency efforts to meet the needs of countries striving to implement Agenda 21.

16. In addition, recognition of oceans as a major factor in world ecosystem changes, on long-term and planetary scales (e.g., climate change) or medium-term and regional scales (e.g., the El Niño phenomenon) could increase government commitment towards the funding of programmes such as GOOS, the Tropical Oceans and Global Atmosphere (TOGA) programme, the Tropical Atmosphere Ocean Array (TAO) and the World Ocean Circulation Experiment (WOCE).

17. The achievements listed in the preceding section together represent a significant change in the context of sustainable development of the oceans and coastal areas, in the areas of information, legal frameworks, institutions and catalytic financing, auguring well for the future. Since UNCED, government commitments to implement pragmatic approaches to sustainable development, including modifying their legal frameworks, improving institutions, and exploring means of communication with the non-governmental community and the public, have significantly increased, particularly in this domain. Given the entry into force of the United Nations Convention on the Law of the Sea and the increasing pressure exerted by NGOs and the public on Governments, there is reason to expect that the numerous and significant international agreements relating to the ocean and its resources will be acceded to in due course and that they will be duly implemented and enforced, particularly in relation to fisheries management and land-based sources of marine pollution.

IV. UNFULFILLED EXPECTATIONS

18. Within Agenda 21, chapter 17 is particularly complex in that it touches upon almost all sustainable development concerns, from both cross-sectoral and geopolitical viewpoints, and requires particularly effective coordination of policies and action at the national and international levels. However, the past five years have shown that, although there is a marked improvement in the awareness of decision makers of the critical importance of ocean and coastal areas, there is still a need to improve intersectoral coordination at the national level and to better harmonize national policies and positions as expressed at the level of United Nations governing bodies.

19. Despite the notable successes outlined above, the degree of implementation of chapter 17 is still insufficient. Governments are facing interacting problems resulting from global climate change, growing populations (in the developing world), demand for and pressure on living marine resources, and increasing pollution from urbanization and industrialization in the coastal zone. However, governmental action has not yet been sufficient to bring about a reversal in the decline of resources and environmental conditions or to ensure better protection against natural disasters. While legal and institutional instruments have definitely improved the basis for sustainable development of oceans and coastal areas, implementation lags behind owing, among other things, to (a) the difficulty in making political decisions regarding resources and wealth allocation; (b) the difficulty of improving inadequate or inefficient institutions; and (c) in many cases, difficulties in meeting the related financial commitments.

20. While recognizing the need to identify sustainable financing mechanisms at the national and regional levels, it cannot be overemphasized that without adequate financing (and financial assistance) for implementation, many Governments may not be in a position to implement the provisions of the various international undertakings they have subscribed to. Consequently, many of the outstanding objectives within chapter 17 might not be reached. The deficit in financing of UNCED-related strategies is aggravated by the significant decrease in funding available for technical assistance within the United Nations specialized agencies and mechanisms.

21. While the need for improved information is recognized, the actual trend in the quality and quantity of data and information being gathered and exchanged is decreasing owing to the impact of economic constraints, particularly but not only in developing countries and countries with economies in transition, and, often, the lack of real priority accorded by Governments.

22. Action to be taken in preparation for and during the 1998 International Year of the Ocean will help create further awareness and perhaps strengthen the commitments of Governments to solve ocean problems and give the right level of priority to the ocean as a finite economic asset.

V. EMERGING PRIORITIES

23. The report of the Secretary-General on chapter 17, submitted to the Commission at its fourth session (E/CN.17/1996/3 and Add.1), and the consideration of its recommendations by the Ad Hoc Inter-sessional Working Group on Sectoral Issues in February 1996, as well as the decisions of the Commission at its fourth session, provided specific direction for (a) the development of institutional arrangements for the implementation of the Global Plan of Action for the Protection of the Marine Environment from Land-based Activities, with particular emphasis on sectoral integration; (b) the improvement of fisheries management in EEZs and the high seas; (c) the fostering of cooperation particularly in the area of programme coordination (through the ACC Subcommittee on Oceans and Coastal Areas) and provision of independent scientific advice to the United Nations system (e.g., through GESAMP).

24. Among the long list of priorities contained in chapter 17, developments during the past five years have underscored a few which emerge as very critical because of their importance to the process of evolution towards sustainable development. These relate, inter alia, to accelerated and viable (better supported) national implementation, including through regional mechanisms; rehabilitation of critical habitats, particularly in the coastal areas; protection of the marine environment from all sources of pollution, including sewage and reduced impact of land-based activities; better account of intersectoral impacts; controlling resource use and improving resource management approaches; removal of long-term development subsidies; more effective people's participation in decision-making (e.g., through community-based management, co-management); better resource pricing as reflected in new conditions for access to resources (e.g., granting of access rights, payment of user fees).

25. More generally, there is the pressing need to (a) upgrade information and ocean observational systems; (b) improve mechanisms, including institutions, for the appropriate management of ocean resources; (c) improve the availability of technical assistance and finance; and (d) increase the effectiveness of international cooperation. These points are dealt with in more detail below.

A. Information

26. There is a need for better understanding of the interactions between sectoral developments and their impact on the ecosystem, including the reversibility of present situations. In relation to this, Governments should address as a matter of urgency the need to maintain and reinforce systematic data collection and observing systems and to provide access to modern means of information processing and communications (e.g., the Internet), particularly at the regional level.

27. There is a need for better information systems (e.g., integrated information systems, Geographical Information Systems) and support for action-oriented research on multi-criteria analysis, communication and negotiation techniques, participatory methods, rapid appraisal methods, resource rehabilitation and reversibility, economic analysis and resource valuation, the

precautionary approach to development, sustainability indicators and criteria and so forth.

28. Scientific progress in ocean and coastal areas as well as technological developments have greatly improved the contribution of operational oceanography to ocean forecasting, opening the way to improved management and more sustainable development, including through the development of early warning systems in the near future. This is the rationale for the creation of GOOS, the further development of which requires significant commitments at all levels.

B. Resource management

29. The past decade has shown that international trade in ocean products, for which there is a growing demand, has developed much faster than resource management institutions. This has resulted in resource depletion, and progress appears urgently required in three areas. First, exclusive property or use rights should be established to promote more long-term conservation-oriented thinking and behaviour. Second, mechanisms should be created to facilitate the participation of people in resource management decision-making processes. Third, the effectiveness of regional resource management bodies should be improved and mechanisms are needed to ensure better cooperation between those dealing with environmental conservation and those in charge of development.

C. Technical assistance and financing

30. Considering the shortage of funding, cooperation in the delivery of technical assistance, at the global or the regional level, should be enhanced further. Development of global or regional cooperative programme frameworks and action plans should be encouraged, with a view to optimizing the provision of assistance to countries in their implementation efforts. Periodic reviews, at the international or regional levels, drawing attention to problem areas and resolving outstanding issues would be important.

31. Efforts should be stepped up to identify and implement innovative fund-raising strategies and to increase government commitments to sustainable development activities, including through better use of trust funds and "seed money" as well as establishment of user fees, taxes and other financial disincentives. Better coordination among donors is essential to improving the effectiveness of the available financial resources. Finally, there is a need for a change in the profile of financing, with priority given to financial schemes that would mitigate destruction of productivity and/or promote rehabilitation.

D. International cooperation

32. As part of its review of implementation of chapter 17, the Commission on Sustainable Development at its fourth session addressed the need for improved international and inter-agency cooperation and coordination in oceans issues and decided to invite the Secretary-General to review the working of the ACC

Subcommittee on Oceans and Coastal Areas, with a view to improving its status and effectiveness; it also invited the executive heads of the sponsoring agencies and organizations of GESAMP to improve its effectiveness and comprehensiveness while maintaining its status as a source of agreed, independent scientific advice.[2] All participating agencies and organizations of the United Nations system should provide guidance to the Secretary-General in these efforts and, if necessary, seek additional financial support from their member States. The further views of the Commission at its fifth session and of the General Assembly at its special session in June 1997 will also be valuable.

Notes

[1] Report of the United Nations Conference on Environment and Development, vol. I, Resolutions Adopted by the Conference (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

[2] Official Records of the Economic and Social Council, 1996, Supplement No. 8 (E/1996/28), chap. I, decision 4/15, para. 45.

UNITED
NATIONS

E

Economic and Social Council

Distr.
GENERAL

E/CN.17/1997/2/Add.17
17 January 1997

ORIGINAL: ENGLISH

COMMISSION ON SUSTAINABLE DEVELOPMENT
Fifth session
7-25 April 1997

Overall progress achieved since the United Nations Conference on Environment and Development

Report of the Secretary-General

Addendum

Protection of the quality and supply of freshwater resources: application of integrated approaches to the development, management and use of water resources*

(Chapter 18 of Agenda 21)

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* The report was prepared by the ACC Subcommittee on Water Resources, as task manager for chapter 18 of Agenda 21, in accordance with arrangements agreed to by the Inter-Agency Committee on Sustainable Development (IACSD). It is the result of consultation and information exchange between United Nations agencies, international and national science organizations, interested government agencies and a range of other institutions and individuals.

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INTRODUCTION

1. This report reviews progress made in the implementation of the objectives set out in chapter 18 of Agenda 21 (Freshwater resources),[1] taking into account the decisions taken by the Commission on Sustainable Development on this subject at its second session, in 1994. Key issues of concern regarding the state of the global freshwater resources have emerged during the preparatory process of the comprehensive assessment of the freshwater resources of the world. The use of water in many regions of the world gives serious reason for concern as to its long-term sustainability, particularly when the need for the preservation of natural ecosystems is taken into account. The assessment shows that, at the present time, as much as one third of the world's population lives in countries suffering from moderate-to-severe stress in terms of water use relative to availability. Furthermore, by 2025, as much as two thirds of the world's population could be living in water-stressed countries. With population increases, economic growth and rising living standards, it may be necessary to use most of the world's readily accessible renewable water resources to satisfy the needs of agriculture, industry and households, and to maintain adequate river flows and protect aquatic ecosystems.

2. Because of the significant link between water resources and agriculture, forestry, terrestrial and aquatic ecosystems and urban development, degrading water quality and the misuse of available water resources impose a major threat to the health and development possibilities of the population in large areas of the world, even in areas currently with abundant water resources. Present lifestyle changes and aspirations, including significant increases in the standard of living and per capita income, continued rapid population growth, industrial development, agricultural trends and increased urbanization - all demand higher water consumption in the decades to come. This requires close attention to water-management issues and to the adequacy of production and consumption patterns

I. KEY OBJECTIVES

3. Chapter 18 of Agenda 21 contains the following seven programme areas:

(a) Integrated water resources development and management;

(b) Water resources assessment;

(c) Protection of water resources, water quality and aquatic ecosystems;

(d) Drinking-water supply and sanitation;

(e) Water and sustainable urban development;

(f) Water for sustainable food production and rural development;

(g) Impacts of climate change on water resources.

4. The key objectives continue to be the provision of an adequate supply of water of good quality for the entire world's population, while preserving the hydrological and biological functions of ecosystems, combating vectors of water-related diseases and adapting human activities within the limits of sustainability. It is now increasingly recognized that the latter objective requires more efficient water-resources management and use.

II. SUCCESSES AND PROMISING CHANGES

A. Integrated water resource development and management

5. Three of the most important contributions of chapter 18 are:

(a) The establishment of thematic areas under which individual countries can formulate and implement national agendas;

(b) The emphasis on integrated water resource planning, development and management;

(c) The emphasis on water as an economic and social good, whose quantity and quality determine the nature of its utilization.

Effective implementation of the recently adopted Global Programme of Action for the Protection of the Marine Environment from Land-based Activities[2] requires an integrative approach be used in order to facilitate simultaneous consideration of freshwater and marine issues as components of a single water-management continuum. Such an approach has encouraged, inter alia, the development of an iterative approach to policy formulation and resource planning, paying particular attention to the failures as well as the successes of various water-related projects throughout the world. It is currently being tested in ongoing technical cooperation activities in many developing countries, such as, Bolivia, Central African Republic, India, Jordan, Morocco, Nepal, Niger, Peru, Senegal and Yemen. Through water-sector assessments, diagnostic studies and national programmes related to water resource planning and management at the river-basin level, an integrated approach is also being taken to water use and the equitable allocation of water among various users. It is characterized by the participation of users and local communities in the decision-making process, including decisions related to the financing of infrastructure. An encouraging note is the fact that the role of women in water resource management is beginning to be increasingly recognized, at both national and local levels.

B. Water resource assessment and the impact of climate change on water resources

6. Recent studies carried out by various United Nations agencies indicated that, in recent times, national hydrological services and agencies, particularly - but not only - in developing countries were becoming less capable of assessing their respective water resources. Many national agencies have been facing reductions in observation networks and staffing at a time when water demand is rising rapidly and when the need for sustainable water resource use is

becoming increasingly urgent. Steps are now being taken to remedy those reductions. Several United Nations funding agencies are supporting initiatives being taken at both the national and global levels. One example is the World Hydrological Cycle Observing System (WHYCOS), whose overall objective is to contribute to the improvement of national and regional water resource assessment capabilities. The initiative is already under way in countries of the Mediterranean basin and southern Africa, and projects for other African regions and the Caribbean are in the pipeline. The International Atomic Energy Agency (IAEA), in cooperation with the World Meterological Organization (WMO) and the International Geosphere/Biosphere Programme (IGBP), is strengthening the operation of the Global Network for Isotopes in Precipitation (GNIP). GNIP has accumulated more than 220,000 items of data from 505 meteorological stations in some 80 countries. IAEA also assists countries in the management of water resources through the integration of isotope methods with other hydrological techniques. The assistance includes capacity-building and the implementation of water resource assessment programmes in member States. The need to strengthen hydrological networks is also being addressed in the United Nations System-wide Special Initiative on Africa.

C. Protection of water resources, water quality and aquatic ecosystems

7. The development, application and surveillance of drinking-water quality guidelines and progress in the eradication of dracunculiasis are clearly two of the most important success stories in this area of chapter 18. Community intervention in preventing the contamination of water sources, the use of filters and chemical treatment have brought a 97 per cent reduction in dracunculiasis as of December 1995. The link between inappropriate water resource development and other vector-borne diseases, such as malaria and schistosomiasis, is also widely recognized.

8. The Joint World Health Organization (WHO)/Food and Agriculture Organization of the United Nations (FAO)/United Nations Environment Programme (UNEP)/Centre for Human Settlements (Habitat) Panel of Experts on Environmental Management for Vector Control (PEEM) has been promoting the application of environmental management for the control of disease vectors in agricultural development projects. It also prepares guideline documents, conducts national workshops and training courses, and supports country-level pilot and demonstration projects. A thorough international assessment of the risks to human health from exposure to microbial and chemical contaminants in drinking water was conducted after UNCED, and recommended guidelines were published in 1993. Health criteria and other supporting information were published in 1996. The guidelines provided the basis for introducing updated national drinking-water standards in many member States. Considerable progress has been made in the establishment of water-quality monitoring programmes worldwide, for many international river basins, such as the Danube, the Mekong, the Plate and the Nile, now covered by multilaterally agreed monitoring networks. Further, the global and regional monitoring efforts of the United Nations Environment Programme Global Environment Monitoring System (GEMS)/Water Programme provide water-quality data and information for both assessment and management purposes. The receipt of

monitoring data from national water-quality laboratories and authorities also suggests that capacities have been improved in a number of countries.

D. Drinking-water supply and sanitation

9. It is estimated that, since the beginning of the 1990s, an additional 800 million people have been provided with a supply of safe water and the total number of people without access fell by almost 500 million. No reliable global inferences are possible concerning increases in sanitation services over the same period, because of the use of significantly more stringent criteria through time regarding what constitutes safe sanitation. It appears, however, that progress in the expansion of sanitation coverage has not been very significant. In spite of an acceleration in the rate of progress over previous decades, it is estimated that at least another 1,100 million people remain unserved and the number of people without access to sanitation has increased to a total of almost 3,000 million. One major reason for optimism, however, is evidence that many countries have started to integrate their drinking-water supply and sanitation programmes more closely into their water resource development strategies and their environmental protection planning. As a result, increasing attention has been paid to the potential health, environmental and socio-economic benefits of effective water resource planning, development and management and to the crucial roles of women and community.

E. Water and sustainable urban development

10. National and city authorities are still finding it difficult to cope with rapidly increasing urban populations. In the developing countries, during the first half of the 1990s, an additional 170 million urban dwellers were provided with safe water and 70 million with appropriate sanitation. However, because of rapid urban population growth, about 300 million urban residents still lacked access to safe water supply, while close to 600 million lacked adequate sanitation at the end of 1994. While the number of urban dwellers with access to safe water in Africa and in Latin America increased by 20 million and 70 million, respectively, between 1990 and 1994, the percentage of people served actually fell in both regions during the same period, because of rapid urban population growth. Similarly, the situation concerning urban sanitation and pollution from urban waste gives cause for concern and, in the case of Africa, for outright alarm. The current rate of service expansion is, in fact, insufficient to prevent an increase in the number of dwellers without access to at least minimum standards of sanitation in all developing country regions.

11. Nevertheless, there are still several reasons for optimism, including the fact that, since UNCED, a number of countries have begun to implement policies and programmes related to major activities specified in chapter 18. In addition, several joint activities by various United Nations organizations have been undertaken to create awareness and build regional and national capacity on the treatment and safe use of municipal wastewater in agriculture and aquaculture. The launching of the United Nations System-wide Special Initiative on Africa and the Habitat Agenda[3] provide further reason for optimism. A consultation including governmental leaders, private developers, leading

non-governmental organizations and United Nations organizations, to be held in March 1997, is expected to speed up the implementation of the Habitat Agenda in Africa.

F. Water for sustainable food production and rural development

12. A key objective of this priority area is assisting member States to achieve food security, sustainable agriculture and rural development through efficient and effective water resource development and management. Progress achieved on this key objective is related to the implementation of several initiatives, such as national action programmes, water policy review and reform, promotion of increased water-use efficiency, irrigation expansion in support of food security and irrigation technology transfer. Several national action programmes on water for sustainable agricultural development have been formulated and are beginning to be implemented in a number of countries and regions, such as China, Egypt, Indonesia, Mexico, the Syrian Arab Republic, the United Republic of Tanzania, Zimbabwe and the Lake Chad basin. Water for sustainable agricultural development is an "upstream activity" which focuses on water-sector and irrigation subsectoral reviews, irrigation policies and strategies, irrigation master planning and project proposals to address technology adaptation, environmental protection and national capacity-building. It is, however, too early to judge the success or failure of such initiatives, although there are reasons for optimism. Despite economic hardships, water scarcity and environmental concerns, irrigation acreage has continued to expand in developing countries, although at a slower rate than in previous decades. In many developing countries, national Governments have allocated a relatively high proportion of their development budget to irrigation expansion and the modernization of existing projects. It is evident that many countries are embarking on national water resource planning as a means to resolve intersectoral competition for water and to deal with water scarcity. Other favourable trends include the transfer of irrigation management responsibilities to farmers, the enhanced role of farmers and communities on decisions relating to irrigation management, and private-sector involvement in irrigation development.

13. Aquaculture continues to be the fastest growing system for the production of fish protein and is now interacting seriously with the environment. This calls for increased assessment and monitoring of its environmental impacts. FAO has elaborated an agreed Code of Conduct for Responsible Fisheries, which includes provisions for both aquaculture and inland fishery management.[4]

III. UNFULFILLED EXPECTATIONS

A. Integrated water resource development and management

14. Major impediments to the implementation of chapter 18 exist largely because of the fragmentation of responsibilities and mandates for water resource management and the somewhat inferior status of water-related activities in relation to other sectoral activities. The practical realities facing many Governments in developing countries, some with extremely limited water resource

bases and most with inadequate institutional arrangements, pose several constraints for the effective introduction of integrated water resource management. Most developing countries have, for reasons of finance and capacity, difficulties extending water-related services and managing and regulating water resource use. In addition, many countries lack adequate legislation and policies aimed at the efficient and equitable allocation and use of water resources. Another serious constraint is that water resource planning is rarely integrated into national macroeconomic planning. Moreover, in spite of the importance of women in environmental protection and development, their participation in the planning and management of water resources is far from the desired level. Water resource planning, development and management have sometimes had unexpected side effects due to lack of consultation and participation at the local level, particularly from women, user associations and community groups.

B. Water resource assessment and the impact of climate change on water resources

15. The fragmentation of institutional responsibilities and the low level of priority given to water resource assessment at the national level are widely recognized as an impediment to the establishment of integrated national databases. The lack of financial and human resources also continue to be major constraints to improving water resources assessment, particularly in developing countries. Recent cutbacks have taken their toll both in terms of the poor operation and maintenance of networks, and the availability and lack of reliability of water information. The lack of sufficient and reliable data on water availability, its use and quality in many areas of the world makes effective national, regional and global water resource assessment difficult, if not impractical. A problem common to many countries is that of training and retaining water resource assessment staff and updating their abilities to implement more advanced technologies and use modern equipment. From a global perspective, there is serious concern about the ability of the national agencies that are responsible for water resource assessment to meet the growing needs for data and information, especially as they relate to sustainable development.

C. Protection of water resources, water quality and aquatic ecosystems

16. There is a global concern over the deterioration in water quality, which is rapidly reducing the potable water resource base. Our scientific understanding of the processes is far from adequate. Water-quality databases are very limited, restricting development of the models required for the application of land and water management guidelines within the framework of water pollution and environmental health. The main obstacles are the lack of effective legislation for the monitoring and control of pollution and the absence of effective cost-recovery systems at the local or national level to meet the costs of treatment, protection of water sources, cleaning up polluted water and other essential measures. Continuous international funding will be required to maintain the momentum in dracunculiasis eradication, given that the required monitoring and certification process is beyond the means of the countries still affected by the

disease. Despite the progress achieved in water quality monitoring, knowledge on global, regional and subregional scales is considerably less than that on water quantity. This is due to the number and complexity of the polluting materials being discharged into receiving waters, inadequate knowledge about the pathways and ultimate sinks of many pollutants, the need for expensive and sophisticated analytical procedures for some pollutants, and insufficient knowledge of the human and environmental impacts of many pollutants, particularly synthetic organic materials.

D. Drinking-water supply and sanitation

17. One of the main constraints in this area remains the dispersed nature of the responsibility for the protection of health and the environment and inadequate policies and mechanisms for efficient and equitable allocation of water resources among competing users, particularly in circumstances where water is relatively scarce. The lack of education/training, public awareness, promotional campaigns, low-cost affordable and appropriate techniques, adequate financial resources and, in particular, pricing policies aiming at generating funds to cover at least operation and maintenance, is also a serious problem in most countries. Another obvious constraint to water resource protection has been the low priority given to sanitation, which is highlighted by the significant increase in the number of unserved people. One innovative way of dealing with the problem, besides greater investments in sanitation and treatment, is to promote increased awareness through health and hygiene education/training of various target groups, primarily women and children, and behavioural change. In addition, with regard to rural sanitation, little progress in expansion can be achieved without integrating sectoral policies into poverty alleviation schemes and rural development strategies.

E. Water and sustainable urban development

18. Rapid urbanization in developing countries and the lack of integrated planning and management of water resources and environmental infrastructure services has been one of the major constraints to achieving the main targets for this programme area. Investments in water supply, sanitation, drainage and solid waste management services are well below the required levels. Most developing countries still depend on insufficient public funds for investments in the sector. In addition, the user charges levied are usually inadequate to cover operation and maintenance costs, let alone investment costs. Lack of security of tenure resulting from bureaucratic obstacles to obtaining land titles in peri-urban or slum areas has also been an important factor behind the lack of investment in such areas, while lack of community involvement in the decision-making process has resulted in many wrong decisions about priorities and the levels of services required. In addition, long-held misconceptions about the inability and unwillingness of the urban poor to pay for water supply and sanitation has been a major constraint to the introduction of appropriate pricing policies which promote efficient water use and the financial autonomy of water companies. Inadequate operation and maintenance of networks and installations reduces the life of assets and has resulted in large amounts of water unaccounted for, due to leakages and illegal connections. Public-sector

institutions responsible for service provision have proven inefficient, lacking transparency and accountability. Because of inadequate remuneration, they have been unable to attract or retain trained personnel, which has significantly affected their ability to manage urban water resources and services.

F. Water for sustainable food production and rural development

19. In many countries, fragmented institutional structures, notably in agriculture, water and environmental ministries or agencies, remain a major constraint. The implementation of important economic instruments, designed to improve water use efficiency, such as, water pricing, water markets and cost-recovery schemes, continues to face serious obstacles throughout the world. Another frequent problem is inadequate funding support for investment and technical assistance in irrigation, from both internal sources and donor countries or institutions. Some countries have well formulated irrigation expansion and rehabilitation projects that require supplementary donor funding for their effective implementation which is not available or forthcoming. On the other hand, funding is often unavailable because many irrigation projects throughout the world are characterized by heavy subsidization and poor rates of performance. Despite huge investments and subsidies, irrigation performance indicators are falling short of expectations throughout the world. In addition, inland fisheries production has fallen drastically over the past decade in many areas because of pollution and environmental modification of waterways. Aquaculture is also experiencing some local problems with availability of water, and in some cases expansion is hampered by the need to conform to regulations regarding the quality of effluents.

IV. EMERGING PRIORITIES

20. The world faces many challenges over the use of the environment as a source of natural resources and as a sink for wastes. As the comprehensive assessment of the freshwater resources of the world concludes, water must be considered one of the most vital issues facing future human use of the environment. Major issues, such as climatic change, deforestation, protection of biodiversity and desertification, are all linked to water resource management. The present situation and current trends are likely to have particularly serious implications in terms of economic development and food production. Unless managed with a view to achieving efficiency and equity, water resources could become a serious limiting factor to socio-economic development in many developing countries. Since many of the negative trends in water resources management will take years or decades to reverse, it is imperative that actions to reverse them begin immediately.

A. Integrated water resource development and management

21. There are at least five important principles without which the path to achieving the goals of integrated water resource development and management will remain blocked. First is the need to establish a process of open and transparent consultation in discussing water resource issues. This involves

building bridges between technocratic and often centralized water institutions and the much more diffuse set of water users in rural and urban settings. Secondly, there is an urgent need to separate regulatory and operational functions. It is now increasingly accepted that an independent water authority, in charge of defining policy and strategies for all water uses, is a sound means for implementing integrated water resource management. Thirdly, the role of legislation should basically be to enable rather than restrict integrated water resource management. It can be argued that a system of stable and identifiable water and land rights will, particularly in relation to irrigation, tend to increase productivity and conservation of water resources. Equally, recognition of customary uses and water rights might enhance trust in governmental activities and programmes. Fourthly, more emphasis needs to be put on demand management and, in particular, water-pricing, as a way to promote efficient water use and generate funds for the operation and expansion of existing facilities. Fifthly, as stated in the Programme of Action of the Fourth World Conference on Women,[5] it is important to ensure that policy makers and planners recognize the benefits of including women in water resource planning, development and management.

22. At the international level, priority should be given to the successful completion of the ongoing inter-governmental negotiations for a global framework convention which would seek to establish an agreed set of general principles and rules governing all international watercourses and to apply and adjust those principles and rules to the unique conditions of each international watercourse and the needs of the States concerned. The draft articles on the law of non-navigable [non-navigational] uses of international watercourses, adopted by the International Law Commission (ILC) in 1994 have been recommended as the basis for a convention on the subject by ILC. In March 1997, the General Assembly will reconvene a working group of the whole to continue the work started in October 1996 on the elaboration of a framework convention on the basis of the draft articles adopted by ILC.

B. Water resource assessment and the impact of climate change on water resources

23. Pooling resources among countries, particularly within international river basins, is one way to improve water resource assessment. The expansion of the above-mentioned WHYCOS initiative and its regional observing systems is a possible solution to the problem of inadequate water resource assessment in many countries and regions. More funding (from both internal and external sources) will also be required for improvements in capability at the national and river-basin level, including human resource development and institutional capacity-building. As regards the impact of climate change on water resources, the projections of the recently published second assessment of the Intergovernmental Panel on Climate Change (IPCC) state that the hydrological cycle will intensify with global warming.[6] This could lead to more severe droughts in some areas and catastrophic flooding in others. The IPCC's best estimates of a likely rise of 50 centimetres in average sea level by the end of the twenty-first century will result in salt-water intrusions affecting coastal cities and heavily populated delta regions. Data collection and monitoring systems will need to be geared specifically to these issues.

C. Protection of water resources, water quality and aquatic ecosystems

24. There is need for Governments to enhance their water-quality monitoring and assessment programmes. Sustained socio-economic development requires accurate information on the quality and quantity of freshwater resources and on the coastal areas into which they ultimately drain. Such efforts, at first glance, are expensive and time-consuming, with no immediate payoffs. Nevertheless, without such information, nations could easily make development decisions with costly, sometimes even catastrophic, consequences over the long term. For example, safeguarding and improving the quality of drinking water requires intensive backstopping of the national health, water and environmental authorities through advisory services, expert consultant services and intersectoral training programmes. This situation had a precedent in the 1960s, when recognition of an insufficient understanding of global hydrology for water resource management prompted proclamation by UNESCO of the International Hydrological Decade (IHD), 1965-1974. That global programme set up through United Nations inter-agency cooperation and underpinned by strong support at the national level in many countries, facilitated the establishment of a network of representative basins, improving understanding of hydrology and water resource management. In a cooperative effort by UNESCO, UNEP and the United Nations University, a comprehensive water-quality programme is being developed. It is to be based on a global network of representative drainage basins, encompassing the broad spectrum of environments, to allow future extrapolation to unmonitored basins.

D. Drinking-water supply and sanitation

25. In urban areas, the ultimate solution will be to integrate water supply and sanitation services for the peri-urban poor with the established urban systems. This will require the full physical integration of those systems and the assignment of responsibilities to the appropriate urban utilities. It will also require the establishment of an enabling environment for the financial and administrative autonomy of water and sanitation utilities and for institutional capacity-building. More research and information exchange is required on innovative technical and administrative approaches. With regard to rural water supply and sanitation, the challenge is to maintain at least the progress reported to date and, in particular, to strengthen the household water supply component of rural development and agricultural projects. In addition, more responsibility has to be delegated for rural sanitation to the local level, with corresponding budget allocations and accountability, with particular emphasis on community participation, self-reliance and the central role of women in water resource management. Emphasis should be given to a gradual introduction of economic mechanisms aimed at ensuring that rural water supply becomes self-financing, at least in terms of operation and maintenance. At the same time, additional external funding will also be required for the expansion or improvement of water supply and sanitation facilities, particularly in developing countries. The issue of sustainable water use and sanitation supply demands high priority at the country level. It is thus encouraging to note that the countries of the African region have established the Africa 2000 Initiative

for Water Supply and Sanitation and have proposed that it be linked to the United Nations System-wide Special Initiative on Africa.

E. Water and sustainable urban development

26. The Habitat Agenda[2] calls for an integrated approach to water resource management and the links between water, sanitation and health, between the economy and the environment, and between cities and their hinterlands. There is a need to further strengthen the capacities of national and city authorities to provide the right legal and regulatory framework for the participation of all stakeholders, including women, in the planning, provision and management of services. Planning should be at the water-basin level and should consider both short and long-term needs of all uses and users of water resources. Public/private partnerships and community participation in decision-making, service provision and management should be encouraged. Private-sector funds should be sought to bridge the widening supply/demand gap, and tenure issues in peri-urban areas should be regularized so as to encourage investments. Adequate tariff levels should be charged, in order to recover investment, operation and maintenance costs, with mechanisms to ensure that the needs of the poor are adequately catered to. Strategies for demand management and control of wastage should be promoted in order to reduce the amount of unaccounted for water and discourage wasteful use, as a first alternative to investments in new installations. Pollution control should be more vigorously pursued, inter alia, through economic instruments of pollution abatement.

F. Water for sustainable food production and rural development

27. As a matter of priority, irrigation development should be addressed on a more systematic basis. There is a need for better designed projects at the national level, with particular attention being paid to environmental impact and economic performance, together with policies aimed at creating an environment that encourages private-sector investment (internal and external) and donor support. The challenge is to move towards means of irrigation that are economically more efficient or crops that are less water-intensive - that is, to produce more food with less water so that more water can be transferred to higher-value uses. More emphasis should be given to rainfed agriculture, and more efficient economic alternatives to irrigated agriculture. While developing countries should demonstrate their willingness and ability to make irrigation economically sound and environmentally viable, technical assistance programmes should also be better designed and "tailor-made" to individual country needs. Broadly speaking, the programmes should focus on national policy review and reform, including institutional mechanisms to implement economic and environmental principles, and on building national capacity so that the countries will be able to design, implement, operate and maintain their irrigation systems in a sustainable manner. Given that water management for sustainable food production and food security goes beyond the farm boundaries, it is also essential to integrate agricultural strategies into broader regional and rural development strategies. Emphasis should be given to the central role of local communities and, particularly, to women, not only in rural water

resource planning, development and management but also in small-scale agriculture as a source of income and local food self-sufficiency.

28. Inland fisheries can be conserved only in a framework of basin planning where the elements needed for the survival of the fish are guaranteed, such as in-stream flow needs, channel diversity, wetland conservation etc. Further growth of aquaculture will depend on further information on risks to the environment. Much risk can be avoided by development and dissemination of more efficient use of water, improved feeds and more efficient water treatment systems.

Notes

[1] Report of the United Nations Conference on Environment and Development, vol. I, Resolutions Adopted by the Conference (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

[2] A/51/116, annex II.

[3] "Report of the United Nations Conference on Human Settlements (Habitat II), Istanbul, 3-14 June 1996" (A/CONF.165/14), chap. I, annex II.

[4] Resolution 4/95, of 31 October 1995, of the FAO Conference.

[5] "Report of the Fourth World Conference on Women, Beijing, 4-15 September 1995" (A/CONF.177/20), chap. I, annex I.

[6] See Climate Change: the IPCC Scientific Assessment (Cambridge, Cambridge University Press, 1993).